This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`

379.153
P689

LELAND·STANFORD·JVNIOR·VNIVERSITY

THE VALUE OF SCHOOL SUPERVISION

THE VALUE OF SCHOOL SUPERVISION

Demonstrated with the Zone Plan in Rural Schools

By

MARVIN SUMMERS PITTMAN

Head of the Department of Rural Education
Michigan State Normal College
Ypsilanti, Michigan

STANFORD LIBRARY

BALTIMORE
WARWICK & YORK, Inc.
1921

Copyright, 1921, By
WARWICK & YORK, Inc.

286339

STANFORD LIBRARY

18

ACKNOWLEDGMENTS

The writer is indebted to many people for assistance in connection with the experiment upon which this discussion is based and the formulation of the data which present the results in their final form. He wishes to make special aacknowledgment to the following:

Dr. H. W. Foght, President of the Northern Normal and Industrial School, Aberdeen, S. D., and Miss Lucile Trott, County Superintendent of Brown County, for their administrative support and personal assistance;

Misses Ida Buchert, Edna Luke, Martha Pabst, Birdie Williams, Mildreth Nolen, Lennie Cox, Vivian Neiger, Myrtle Wineland, Louise Low, Beulah Williams, Marie Schrimpf, Ida Gunderson, Alma Wiedibusch, Bessie Freeman and Mr. R. H. Rhoades for their co-operation as the teachers of the schools in which the experiment was conducted;

Various members of the faculty of the Northern Normal and Industrial School and especially Miss Ivy Husband and Mr. J. W. Thomas, who assisted in administering and scoring all tests and without whose help the experiment would have been practically impossible; and

Dr. W. C. Bagley for constructive criticism, Dr. Fannie Wyche Dunne for most constructive suggestions and criticism, Dr. Wm. A. McCall for his

guidance in all of the statistical computation, and Dr. Frederick G. Bonser, who served as chief advisor to the writer in the selection of the problem, the field activities of the experiment, and the writing of this book.

TABLE OF CONTENTS

Introduction by Frederick G. Bonser..... 1
Chapter I.—The Problem, the Method, and the Results Stated
A. The Problem..... 5
B. The Method..... 5
C. The Results and Conclusions..... 6
Chapter II.—The Determining Conditions of the Experiment.
A. The Conditions Required..... 9
B. Required Conditions Found in Brown County, S. D..... 10
Chapter III.—The Equivalence of Groups
A. Locations of the Two Groups..... 12
B. Particulars in which Groups Were Compared.
1. Types of Schools..... 13
2. Length of School Term..... 14
3. Social and Economic Status of Communities 14
4. Parentage of Children — Nationality, Education, and Wealth..... 15
5. Character of Teachers Employed—Age, Education, Experience, Certification... 16
Chapter IV.—The Zone Plan of Supervision Used
A. The Zone Plan Defined..... 19
B. Calendar of Events for the Year..... 19
1. Supervisory Tours..... 20
2. Teachers' Meetings 21

C. A Sample Supervisory Letter..... 23
D. What the Supervisor Did While on a Tour 25
E. What Was Done at the Group Teachers' Meetings 30
F. Discussion of Teacher's Classroom and Demonstration Teaching..... 37
1. The Limitations of the Individual Conference 38
2. Advantages of the Group Conference... 38
Chapter V.—Community Activities of the Supervisor
A. Visits in the Homes of the People..... 41
B. The School Newspaper for the Zone..... 42
C. Social Phases of the Teachers' Meetings.. 44
D. The "Health and Happiness" Meetings.... 45
E. The Spelling Matches..... 47
F. The Crusade Against Gophers..... 49
Chapter VI.—The Statistical Data of the Experiment
A. The Tests 51
1. Functions Tested 51
2. Tests and Scales Used..... 51
3. When Tests Were Given..... 52
4. By Whom Tests were Administered..... 52
5. By Whom Tests were Scored..... 53
B. How the Data Which Used were Secured. 53
C. How the Data Are Presented..... 54
D. What Tables I-VII Show..... 55
Table I. Third Grade..... 57
" II. Fourth Grade..... 58
" III. Fifth Grade..... 59
" IV. Sixth Grade..... 60

" V. Seventh Grade..... 61
" VI. Eighth Grade..... 62
" VII. Summary—All Grades..... 63
E. What Tables VIII-XXI Show 64
Table VIII. Speed in Reading..... 65
" IX. Speed in Answering Questions on Reading..... 66
" X. Index of Comprehension... 67
" XI. Number of Questions Answered Correctly on Alpha 2 68
" XII. Spelling 69
" XIII. Composition 70
" XIV. Speed in Penmanship..... 71
" XV. Quality in Penmanship.... 72
" XVI. Number right in Addition.. 73
" XVII. Number right in Subtraction 74
" XVIII. Number right in Multiplication 75
" XIX. Number right in Division.. 76
" XX. Number right in Fraction.. 77
" XXI. Summary of Equated Differences 78
" XXII. Summary of Percentages of Pupils Improving 80
F. Summary of Statistical Results..... 81
Chapter VII.—Other Results Not Shown by the Standardized Tests
A. Results Indicated by the Children..... 83
B. Results Indicated by the Patrons..... 84
C. Results Indicated by the Teachers..... 89
D. Results of Special Campaigns..... 91

Chapter VIII.—The Results of Supervision Restated and Discussed
A. The Results 94
1. Amount of Superiority of Improvement 94
2. Monetary Value of the Supervisor's Service 100
3. Professional Reading of Teachers..... 101
4. Effect upon School Attendance..... 101
5. Effect upon the Progress of various Grades 102
6. Effect upon Retention in School of Older Pupils 103
7. Effect upon Social Life of Community.. 104
B. Special Related Conclusions..... 104
1. Progress in Supervised Subjects not Detrimental to Other Subjects..... 104
2. Supervision Must Fix Attention upon Elements to Be Improved..... 106
C. General Conclusions from the Entire Study. 107
Chapter IX.—Further Elaboration of the Zone Plan Looking Toward Its Application
A. The Sphere of the Supervisor..... 109
B. The Schedule of the Supervisor's Work.. 112
C. The Supervisor's Assistants..... 119
D. The Supervisor's Use of Publicity..... 123
Bibliography 127

INTRODUCTION

Among all of the forms and grades of schools under public administration, there are none as much in need of supervisory guidance and help as the district schools in the open country. Such schools represent the most difficult supervisory problems found in our school system. Country schools are distant from each other and from county seats. Country roads are often poor. To visit country schools is enormously expensive in time, money, and energy. It is difficult to bring teachers together frequently for group conferences. To develop any plan by which supervision of country schools may be made more efficient and at an expenditure of time and money which does not make it prohibitive is therefore to make a very genuine contribution to the progress of country school education.

There is involved here, however, a very fundamental question as to the values of school supervision itself. Under whatever plan proposed, is supervision worth its cost.? Hitherto there has been no answer to this question supported by adequate evidence in concrete, scientific form. There has been no definite, measurable comparison of the progress of children and teachers who were supervised and of those who were unsupervised under conditions otherwise the same.

The two problems, that of the worth of supervision and that of a plan of supervision sufficiently definite to measure the results of its operation were inseperably connected. The worth of supervision could not be

determined without an adequate plan for supervision, and such a plan could not be tested as to its worth without means for measuring school progress, thereby ascertaining whether there were values assignable to the supervision. Fortunately, we have now reached a point in the development of measurements in some school achievements which makes comparisons in progress possible.

Professor Pittman has succeeded in devising a "Zone Plan" of supervision by which he has been enabled to supervise a group of representative country schools much more intensely than is usual, and to measure the result of such supervision. For comparison he has had an equally representative group of relatively unsupervised schools with conditions other than those of supervision approximately the same.

The results are highly gratifying. Positive values of supervision, sufficiently substantial to give them much weight have been demonstrated. The plan devised has been found practicable and not sufficiently expensive to make it prohibitive.

While the advances in school progress clearly assignable to supervision constitute the most definitely scientific evidence of the values of supervision, the evidences through the increased interest in school life by the children, the development of wider cooperation between home and school, the more intelligent and sympathetic interest of parents in education, and the enlarged professional spirit and growth of the teachers are all of significance in attesting the values of the work. These evidences are not yet measurable by reference to standards as are gains in the school subjects used

as bases of measurement. But that such evidences, when described, are clearly appreciable as quantitatively larger than the same types of interest and activity in unsupervised schools adds materially to the sense of value of supervision.

In the plan used, there are elements of supervision which are distinctly new and which commend themselves as highly worth while. The direct contact of the supervisor with both children and parents as well as with teachers is a feature of supervision in which Professor Pittman has made a pioneer contribution. He appealed to worthy incentives of both children and parents which elicited their cooperation and support in promoting the educational progress of the children and the community, both in school and out of school. The plan which he devised and employed makes this possible as no other general plan of county or district supervision has done. The experiment has therefore yielded two distinct though vitally related contributions to the field of country school supervision—scientific evidence that supervision has positive values in a degree worth while, and a plan that is both practicable and educationally commendable.

This plan of supervision requires the expenditure of more money than is usually devoted to rural supervision. But this is also true of any plan of successful supervision of rural schools. There are very few counties or districts in the United States in which there is an adequate number of supervisors to give proper help to the schools under any plan. By this Zone Plan, together with the methods of supervision employed by Professor Pittman, the cost would be as low as that

of any plan yet devised, and it has the virtue of tested efficiency which gives reasonable promise that the money spent will bring results well worth all that they cost.

District, county, and state superintendents should find this study of great value in working out their problems of rural supervision. The evidence which it contains should help them materially in convincing the authorities, whose financial support they must secure, of the values of supervision and of the practicability of a plan that has been found to work with demonstrated success. The experiment and its results inspire one with optimism and a renewed hope that the difficult and pressing problem of rural supervision has been brought very near to a satisfactory solution.

The country schools and the country school authorities are placed under great obligation to Professor Pittman for his plan and the demonstration of its efficiency. All interested in elementary school supervision are indebted to the study as furnishing positive evidence of the values of supervision in terms that are measurable and in degrees of worth sufficient to justify its reasonable cost.

FREDERICK G. BONSER

Teachers College,
Columbia University

CHAPTER I

THE PROBLEM, THE METHOD, AND THE RESULTS STATED

A. THE PROBLEM

Does the supervision of schools pay? If so, to what extent, in what ways and under what condition?

These are questions which the school administrators, the teachers and the taxpayers of America have been asking with increasing earnestness and frequency during recent years.

With a view to giving at least partial answers to these important educational questions, the investigation discussed in the following pages was undertaken. Since it was necessary to limit the scope of the investigation, it was restricted to the following question:

What is the effect of supervision upon the work of rural schools when the supervision is done according to the Zone Plan?

(The Zone Plan will be described later)

B. THE METHOD

The equivalent groups method was used in conducting the experiment upon which this discussion is based. The method is a familiar one to those acquainted with educational investigation. To others it is sufficient to say that two groups whose equivalence is determined, or whose difference is evaluated and allowed for, are compared in their ability to perform certain work. Ideally, the only element of difference between the

two groups is the one factor, the effect of which is being tested. In practice, this cannot always be absolutely the case but the differences can be determined in advance of the experiment and taken into account in evaluating the results.

In this experiment the standings of the children in thirteen school functions were determined in the early days of October 1919 for both groups, the experimental (the group under investigation) and the control (the group with which the experimental was compared). This was followed by seven months of supervision of the school work of the experimental group only. The standings of the two groups were again determined in May, 1920. The differences in the amounts of improvements made by the two groups in the functions under investigation during the intervening seven months were credited to the effect of supervision.

C. THE RESULTS AND CONCLUSIONS

1. *Results.* The results of supervision in the experiment hereafter described were positive in the particulars and to the extent stated below:

(a) Children in the supervised schools, when measured by equated differences and by percentages of progress of the experimental group measured in terms of progress of the control group, advanced approximately 194 per cent, as far during the seven months in the particular functions under investigxation as did the children with whom they were compared.

(b) Upon this as a basis and assuming the social value of this type of educational material, the value of

the service of one supervisor, who would produce such a difference in the total results of the school work for forty-five schoolrooms similar to those supervised, would be $45,102.15 per school year for that service alone.

(c) The teachers under supervision did, approximately, four times as much professional reading as they themselves had done during the previous year and four times as much as the group of teachers with whom they were compared during the year of the experiment.

(d) The average attendance, measured in terms of total enrollment, was 76 per cent for the year in the supervised schools as against 70.7 per cent. in the unsupervised schools.

(e) In the schools under supervision all of the children in the grades from three to eight, inclusive, made excellent progress with greater gains usually in the lower grades. In the schools not having supervision, the children in the grades below the seventh did not make the progress which might have been expected if the progress of the seventh and eighth grades were taken as a standard by which to compare them.

(f) Supervision served to keep in school children who were in the seventh and eighth grades. Of the children who entered those grades of the supervised schools, 92 per cent continued in school to the end of the year. In the unsupervised schools, only 69 per cent completed the school year.

(g) Supervision promoted the social life of the community.

2. *Supplementary Related Conclusions.*

(a) While supervision gave positive results in subjects supervised, it did not interfere with the progress of subjects not especially supervised.

(b) In order to get the best results from supervision, the attention of all concerned must be centered upon the particular phases which it is desired to improve.

CHAPTER II
DETERMINING CONDITIONS OF THE EXPERIMENT

A. THE CONDITIONS REQUIRED

Having decided to test the value of supervision of rural schools, to find a suitable place for conducting the experiment was the first problem which confronted the writer. Three conditions seemed necessary in order that the experiment might result in a successful performance, provide reliable data, and yield results of educational significance. These three conditions were:

1. The supervisor must have freedom to conduct the experiment according to conditions necessary for its scientific success. For this, two groups of schools having practical equivalence in all particulars, except the one factor of supervision, were required. What was done with the supervised schools should not be known or copied by the unsupervised schools.

2. The co-operative assistance of competent educators was necessary at the time of administering and scoring the tests.

3. A territory, genuinely rural in character, was desired. The schools should be small, far apart, and taught by teachers no more efficient than the average rural teachers of the nation. The weather conditions should be such as to test the determination of the supervisor. The travel conditions should be as difficult as that confronting the average supervisor of rural schools in any section of America.

B. THE REQUIRED CONDITIONS FOUND IN BROWN COUNTY, SOUTH DAKOTA

All of the conditions set forth above were happily met in Brown County, South Dakota.

1. Through the co-operation of Miss Lucile Trott, the county superintendent of schools, the writer was privileged to conduct the experiment according to conditions mentioned in "A" above. Because of the large number of schools in the county and the lack of field deputies, Miss Trott was unable to make more than one visit to each school during the year. This visit was made to the supervised and unsupervised schools alike. No other supervisory assistance was given by the superintendent to the schools of either group except that which was given through the regular institutes which were given to all teachers alike. Miss Trott very kindly gave permission to work with the teachers and children in any way which would improve the character of the work.

2. Through the co-operative assistance of President H. W. Foght and the faculty of the Northern Normal and Industrial School and of the county superintendent, sufficient competent assistance was provided for administering the tests and scoring the papers. This assistance was rendered at such times and in such quantities as to give the most reliable statistical data.

3. Brown County, outside of the town of Aberdeen, is genuinely rural territory. A very large percentage of the schools of the county are one-teacher schools. They are located, on an average, about four miles apart. The one-teacher schools have an enrollment of from six to twenty pupils with an average of about

twelve. The teachers of these schools are usually young with limited training and experience. In order that the travel conditions in Brown County during the year of the experiment may be known, the following facts are given: The temperature ranged continuously below freezing from October 25th to March 20th. A zero temperature or lower was registered during much of the time. The roads were impassable for anything but sleighs during several weeks of this time because of drifted snow. Travel was very difficult during the first month after the spring thaw.

Chapter III

THE EQUIVALENCE OF GROUPS

A. LOCATION OF TWO GROUPS COMPARED

Two groups of schools located in Brown County were selected for comparison. One group, known throughout this discussion as the experimental group, was composed of fifteen schoolrooms located south of Aberdeen. Another group, known throughout this discussion as the control group, consisted of twenty-five schoolrooms located north of Aberdeen. The writer was told by the county superintendent that in so far as she could tell the two groups were very much alike, with no advantage to either. They were arbitrarily selected, therefore, being the fifteen schoolrooms most closely situated to each other in the one group and the twenty-five schoolrooms most closely situated to each other in the other group. The schools which formed the experimental group were located within an area whose measure was eight miles by twelve miles. The schools which formed the control group were within an area whose extent was about twice the size of that of the experimental group.

B. PARTICULARS IN WHICH GROUPS WERE COMPARED

In order to determine the extent of equivalence of the schools which formed the two groups, comparisons were made in the following particulars:

1. Types of schools.
2. Length of school terms.
3. Social and economic status of communities.

4. Parentage of children—nationality, education, wealth.
5. Character of teachers employed—age, education, experience, certification and salary.

1. *Types of Schools*—Of the fifteen schoolrooms in the experimental group, eleven were one-teacher schools, four were in two-teacher schools. Of the twenty-five schoolrooms in the control group, fifteen were one-teacher schools, ten were in two-teacher schools. From another study made by comparing the work in all of the one-teacher schools in the two groups with the work in all of the two-teacher schools, the writer found that the work in the two-teacher schools was superior to that in the one-teacher school.

The study upon which this conclusion was based compared 194 children in twenty-eight one-teacher schools with 182 children in fourteen schoolrooms in two-teacher schools. The children were compared by one test in each of thirteen functions. Out of a total of seventy-eight median scores, the scores of the two-teacher school group were equal or superior to the scores of the one-teacher school group fifty-eight times.

From the results of this related study of the same children who are involved in the expperiment under discussion, the writer concludes that whatever advantage there was to one of the groups—the experimental or the control—the advantage in this particular was with the control group. This is true because a larger percentage of the children of the control group was in two-teacher schools than there was in the schools of the experimental group.

Considered from the point of view of the amount of taxable property supporting each child in school, the schools of the control group were also better situated. For each child enrolled in the schools of the experimental group, there was assessed property to the extent of $26,940.00, while for the children of the control group there was a property valuation for each child of $32,310.00, giving an advantage to the control group of $5,362.00 per child.

2. *Length of School Terms*—The control group had considerable advantage in the length of school terms. Seventy-six per cent of the schools of the control group had nine months terms while only sixty per cent of the schools in the experimental group had nine months terms. All of the other schools of both groups had eight months terms. The effect of longer school terms of previous years, taken with other factors of superiority, was quite evident at the time of the initial tests, the median scores of the children in the control group almost uniformly ranging higher than that for the children of like rank in the experimental group.

3. *Social and Economic Status of Communities*—The social and economic status of the people living in the areas which formed the two groups was very similar. To a casual observer there was practically no difference. From the data quoted under the last topic, it appears that there was more wealth per child in the area of the control group. This was not perceptible to a superficial observer. There were five communities in the control group where the people were closely enough associated to make two-teacher schools possi-

ble, but since the area favored was fully twice that of the experimental group area, the advantage in this particular was slight. The people living in the two groups were removed about an equal distance from Aberdeen, the nearest trading center. There seems, therefore, no commercial advantage to either group.

The social life of the people, outside of that provided by business contact, consisted chiefly of parties held at the homes of the people and of religious services conducted at the little centers of population. At no place in either area was there a very progressive social or religious organization which caused it to be a source of special influence. Taking all of the influences combined in each group, but slight advantage to either group could be seen.

4. *Parentage of the Children—nationality, education, wealth*—The people of Brown County are largely of German extraction. To the German element may be added about an equal number of people of Scandinavian and of English origins. The two sections of the county used in this experiment seem to differ very little in this particular. While there was an occasional school district in which the people were almost exclusively of German, Scandinavian, or English origin, usually there was a population composed of representatives of each nationality.

The educational equipment of the people of the county is quite limited. Probably the fourth or fifth grade standard would be the average for the academic equipment for the adults of the rural sections in both groups studied. Of course there were exceptions. There were some men with high school or college

training, but they were very few. A number of the women of the rural communities had been teachers before they were married. These few better educated people could be found in each of the groups studied but in neither were they sufficiently plentiful to perceptibly affect the results.

In each of the groups, the people were financially comfortable. No extereme poverty was anywhere manifest. Exactly fifty percent of the patrons of the schools in each group owned their homes. The other fifty per cent. were renters. It was not evident to the casual observer who were renters and who were owners of land. Some difference might be observed if the condition of the farm and residential upkeep were taken into consideration. It was not evident, though, tc anyone who met the people at public gatherings or who observed the children in the schools. The renter dressed just as well, rode in just as good an automobile, and used language that was just as nearly correct as did the average land owner. Practically all of the people were progressing from renters to owners, the younger people usually being the renters.

5. *Character of Teachers—Age, education, experience, certification and salary*—Important as are the four preceding topics discussed, not one of them is so important, possibly, to the reliability of the experiment as is that of the teacher. Here, again, we shall see that whatever advantage there is to one of the groups of schools arising out of the character of the teachers employed, that advantage accrues to the control group, rather than to the experimental.

As is the case throughout the entire nation, so in

Brown County, South Dakota, it is the young teachers who teach in the rural districts. In practically every one-teacher school in both the experimental and control groups, a teacher was in charge who was doing her first, second, or third year of teaching. After two or three years of experience the rural teacher usually marries or becomes a teacher in a school of more than one room. Such was the case in the two groups of this experiment. In no case was a teacher doing her first year of teaching in a two-teacher school. Since there was a higher percentage of teachers in two-teacher schools in the control group than in the experimental, it follows that in general a more mature group of teachers were teaching in the control than in the experimental group.

The median educational training for the teachers of the experimental group was 4.2 years above the eighth grade, while the average was 3.74 years. The median for the control group was 4.36 years above the eighth grade, while the average was 4 years. Here again we see that the control group of teachers had a slight advantage.

The median experience of the experimental group was 2 years, that is, the median teacher of the group was then teaching her second year. The average for this group was 4.74, due to the fact that one teacher in the group, Mr. Rhoades, was teaching his twenty-sixth year. This one case of long experience removed the average very far from the median of the group. The median experience of the teachers in the control group was 2.33 years. The average was 4 years. These facts would seem to give a slight advantage to

the control group since the median teacher of that group had had one-third of a year of experience more than had the median teacher of the experimental group.

In the matter of certification, the experimental group had a slight advantage, since 46 per cent of the teachers held first grade certificates and 54 per cent of them held second grade certificates, while in the control group only 36 per cent held first grade certificates and 64 per cent held second grade certificates.

The salaries of the teachers average $96.25 per month for those in the experimental group and $94.50 for those in the control group. This advantage is possibly due to considerable increases received by some of the teachers of the experimental group during the year—due possibly to the interest resulting from the experiment itself.

Summing up all of the conditions considered under our study of equivalence of groups, we see that the differences are not very great. The two groups seemed to be equivalent in the nationality and educational equipment of the people. Their social and commercial opportunities seemed not to differ perceptibly. The percentages of land owners and land renters were equal in the two groups.

The experimental group was superior in the certification and salary of the teachers.

The control group had the advantage in having a higher percentage of two-teacher schools and a higher percentage of its pupils in two-teacher schools. The control group had more taxable property for the support of each educatble child and a slightly longer school term. The teachers of the group had more academic equipment and more experience.

Chapter IV

THE ZONE PLAN OF SUPERVISION USED

A. THE ZONE PLAN DEFINED

A plan of supervision in which the supervisor divides his entire supervisory district into territorial units, each of which serves as the territoral limits for one week of supervisory effort has been designated by the writer as the zone plan. The purpose back of such territorial organization is to provide for systematic superivison of classroom instruction, for convenient, effective, and democratic teachers' meetings, and for the development of a community consciousness on the part of rural communities with a view to inspiring and facilitating more effective social, educational and commercial action. Such a plan was used in this experiment. Since only one week out of each month was used by the writer for field service in the capacity of supervisor in the performance of the experiment, only one zone was used. If full time had been devoted to the experiment, three zones of about equal territorial area and number of teachers would have been taken as the supervisory load.

B. CALENDAR OF EVENTS FOR THE YEAR

The zone plan of supervision implies a calendar of the major events for the year's work. A college announces its calendar of events a year in advance. Why should not a supervisory district do so? Such a calendar was made for the zone in which this experiment was conducted. The calendar was made in the

early days of September and carried out exactly as planned without the change of a single major item. Many minor details were introduced from month to month. The major plans and dates for the year gave stability and continuity to the work. The minor plans and dates provided variety and freshness.

The major events of the zone calendar consisted of (1) supervisory tours and (2) teachers' meetings. The calendar as made, announced and carried out with only a single exception was as follows:

1. *Supervisory Tours*

Sept. 28h to Oct. 10th.....	Initial survey of the experimental and control groups of schools.
Oct. 27th to Nov. 1st.....	First supervisory tour. Improvement in the speed and comprehension of silent reading.
Nov. 17th to Nov. 22nd.....	Second supervisory tour. Language: The elimination of spoken errors.
Dec. 15th to Dec. 19th.....	Third supervisory tour. Spelling: agricultural words as an agency for awakening a community interest in schools and developing a group consciousness.
Jan. 18th to Jan 23rd.....	Fourth supervisory tour. Arithmetic: how to teach the four fundamental operations.
Feb. 15th to Feb. 19th.....	Fifth supervisory tour. Reading: how to secure effective oral reading.
March 15th to March 19th.....	Sixth supervisory tour. Language: how to develop a love for good literature. Health: how to develop the habits of health.
April 11th to April 17th.....	Seventh supervisory tour. Spelling: forming the habit of correctly spelling the words most often used.

2. *Teachers' Meetings*

Oct. 4th—First Meeting—at Warner 10 A. M. to 3 P. M.

(a) Grading some standard test papers in reading and interpreting the scores.
(b) Noon.
(c) Reading demonstration by supervisor suggesting methods of increasing speed and comprehension in reading.
(d) Discussion of demonstration.

Nov. 1st—Second Meeting—at Rondell No. 5, 10 A. M. to 3 P. M.

(a) Demonstrations in reading by three teachers showing their methods of improving speed and comprehension.
(b) Discussion of questions on reading developed during the month.
(c) Language demonstration by supervisor.
(d) Discussion of demonstration.
(e) Noon—Community dinner.
(f) Brief talk by supervisor explaining the plans for year.
(g) Songs by children.
(h) Readings by teachers.

Nov. 22nd—Third Meeting—at Highlands, 10 A. M. to 3 P. M.

(a) Language teaching demonstrations by three teachers.
(b) Discussion of language problems arising during month.
(c) Spelling teaching demonstration—Supervisor.
(d) Discussion of demonstration.
(e) Language games conducted by the children.
(f) Book Reviews—"The Brown Mouse" and "The Fair View Idea," by teachers.
(g) Humorous readings—Supervisor.
(h) Group singing.

Dec. 19th—Fourth Meeting—at Warner, 10 A. M. to 3. P. M.

(a) Brief reports of language work by teachers.
(b) Brief demonstration by supervisor of methods of teaching fundamental operations in arithmetic.
(c) Community spelling match in the spelling of agricultural words.
(d) Noon. Zone Community Dinner.
(e) Zone champions for each subject and grade introduced.
(f) Two minute stunts by each school in the zone.

(g) Brief addresses by visiting educators.

Jan. 24th—Fifth Meeting—at Warner No. 1, 10 A. M. to 3 P.M.

(a) Two arithmetic demonstrations by teachers.
(b) Discussion of questions on arithmetic arising during the month.
(c) Demonstration by supervisor in teaching oral reading.
(d) Discussion of demonstration.
(e) Noon. Community Dinner.
(f) Penmanship demonstration by specialist.
(g) Program by children.

Feb. 21st—Sixth Meeting—at Warner, No. 2, 10 A. M. to 3 P. M.

(a) Demonstrations of teaching oral reading by three teachers.
(b) Discussion of questions arising during the month on the teaching of oral reading.
(c) Demonstration: How to memorize a poem. Miss Gallager.
(d) Demonstration: How to tell a story—Miss Williams.
(e) Noon. Community Dinner.
(f) Discussion: What I think of supervision. The teachers.
(g) Discussion: What I think of supervision. The patrons.
(h) Discussion: What I think of supervision. The supervisor.

Mar. 20th—Seventh Meeting—at Warner No. 6, 10 A. M. to 3 P. M.

(a) Language teaching demonstrations by three teachers.
(b) Discussion of language question arising during month.
(c) Spelling teaching demonstration by supervisor.
(d) Discussion of demonstration.
(e) Noon. Community Dinner.
(f) Art exhibit and lecture by specialist.
(g) Discussion: Why we cannot spell. By a specialist.
(h) Industrial demonstration by children: How we make things.

(This meeting had to be cancelled because of a very deep snow which fell on March 19th.)

April 17th—Eighth Meeting—at Mansfield, 10 A. M. to 3 P. M.

(a) Written spelling match between the Blue and Whites.

(b) Oral spelling match between the Blue and Whites.
(c) Noon. Zone Community Dinner.
(d) Addresses by visiting educators.
(e) Stunts by the schools of the zone.
(f) Announcing the winners in the contests.

C. A SAMPLE SUPERVISORY LETTER

While the schedule of visits of the supervisor was announced at the beginning of the year for the entire year, the writer felt that this was not definite enough tc serve the best interest of effective supervision. He, therefore, sent out a letter about one week in advance of his tour each time announcing the details of the tour. He gave the exact time that he would arrive at each school and the length of time that he would devote to each school. About an equal length of time was devoted to each school without reference to the efficiency of the teacher, the number of children, or the character of work found. Reasons for this will be discussed in a later section.

The letter also contained a few pertinent suggestions with reference to the subject that would be under investigation during the tour. Announcements and other matters of general importance to the Zone were communicated through the letter. Below is given, as an illustration, the first letter announcing the exact dates of the supervisor's visits.

October 20, 1919.

Dear Teachers:—

Below is given the schedule for my first regular visit as Helping Teacher. I have stated the time just as definitely as possible so that there may be as little lost time as possible and so that you may be able to present just what you want to present when I am with you

Monday, Oct. 27th, Miss Buchert's school—10 A. M. to 12 M.
" " " , Miss Luke's School—1 P. M. to 2 P. M.
" " " , Miss Pabst's School—3 P. M. to 4 P. M.

Tuesday, Oct. 28th, Miss Knudson's School—10 A. M. to 12 M.
" " " , Miss Lowe's School —1 P. M. to 2:15 P. M.
" " " , Miss Wineland's School —2:15 P. M. to 4 P. M.
Wednesday, Oct. 29th, Miss Birdie Williams' School —9 A. M. to 10:30 A. M.
Wednesday, Oct. 29th, Miss Nolen's School, 11 A. M. to 12 M.
" " " , Miss Cox's School —1 P. M. to 2 P. M.
" " " , Miss Schrimp's School —2:30 P. M. to 4 P. M.
Thursday, Oct. 20th, Miss Beulah Williams' School — 10 A. M. to 12 M.
" " " , Miss Neiger's School —1 P. M. to 2 P. M.
" " " , Miss Gunderson's School —2:30 P. M. to 4 P. M.
Friday, Oct. 31st, Miss Weidebusch's School—10 A. M. to 12 M.
" " " , Miss Freeman's School—1 P. M. to 2:15 P. M.
" " " , Mr. Rhoades' School—2:15 P. M. to 4 P. M.
Saturday, Nov. 1st, SECOND REGULAR TEACHERS' MEETING, HELD AT MISS PABST'S SCHOOL, RONDELL NO. 5, 10 A. M. to 3 P. M.

I shall keep the above schedule just as nearly as possible and will be at the place named at the appointed hour PROVIDED (1) The Ford runs; (2) the temperature is not below zero; (3) I am not ill.

While I am with you, I hope you will teach reading classes. If there is any time left, I trust that you will teach a language or grammar lesson.

I hope you have found the suggestions that were made on sheet III distributed at the last teacher's meeting, helpful to you during the month. I trust that you have been making notes daily on your efforts, results and observations.

Will you be good enough to write all questions that you wish to ask help on either from me or the other teachers and give them to me when I come? This will help you to write out your questions, will help me in studying them and be of help to all of the other teachers also. I shall compile all of these questions and have them ready for the Teachers' Meeting on November 1st.

Of course you are planning to be present at the Teachers' Meeting. The last one was very interesting and profitable.

Let's make each of the others even better. We want 100% present EVERY time. That will guarantee successful meetings. Miss Pabst and her people are to be our hostesses and we want to show them how we can show our appreciation.

Will you please send me an item or two for the Zone Joy Maker (Monthly Bulletin) about your school that you think might be of some help to other schools and in which your own children and community take pride.

I am looking forward to my visit to your schools with great pleasure and am sure I shall see some excellent reading.

With best wishes, I am

Yours very truly,
M. S. PITTMAN,
Helping Teacher.

D. WHAT THE SUPERVISOR DID WHILE ON A TOUR

1. *The background and the outlook for the tour.* At each teachers' meeting the supervisor taught a demonstration lesson in the subject which would be under special investigation during the month immediately following the meeting. The supervisor's demonstration had for its purpose the setting up of the problem for the month. It was not a model lesson but a suggestive lesson. There was a particular problem to be solved. His demonstration was an attempted solution, not a conclusive one. After each demonstration there was a conference at which questions were asked and difficulties pointed out.

The teachers went back to their schools and had three weeks in which to experiment, read and think over the problem before the supervisor would visit them. Each teacher was asked to keep her eyes open tc difficulties and to discoveries. She was urged to experiment, to try her hand at new things. If she made a discovery it was to be given to the rest of her group.

The teacher usually secured the co-operation of the children with some such statement as this:

"Children, what is our subject for special study this month."

"I wonder if we can do that subject better this month than we have ever done it before?"

"Would you like to try some new ways of doing it?"

'Would you like to have the supervisor feel that our school can do that subject just as well as any school in the zone, or even better than any other?"

With this background and this outlook the teacher and the children set to work. After three weeks of work they were prepared to be observed. They had lived through, in prospect, the visit of the supervisor. They had worked on their subject for a sufficient length of time to gain ease in doing what they did and to discover the difficulties which they had not yet mastered. They, both the children and the teacher, looked forward to the visit of the supervisor, therefore, as an opportunity to be both appreciated and to be helped.

2. *Three or More Recitations of the Same Subject Observed.* The teacher and the children knew in advance just when the supervisor would be with them and just what particular work he was coming to see. All of the people of the school community also knew. So did the supervisor know. This unity of purpose on the part of all concerned did much to stimulate effective work and to clarify the aims and the methods of work for all concerned.

For the purpose of stimulating good work on the part of both teachers and children, there is perhaps

no better means than the approaching visit of the supervisor. In the early stages of supervision this may cause a little nervousness and may lead to a disposition to make an exhibition. These undesirable reactions soon disappear under sympathetic professional treatment and poise of manner and a high standard of regular work take their place.

When the supervisor arrived at the school he was asked which class he would like to see first. All classes were prepared. Those classes were most happy which were called for. Not always did all classes get an opportunity to recite during the supervisor's visit. In some schools, certain classes were observed in the particular subject under investigation and then a class or two in some other subject not under investigation were observed. This was regulated by the diagnostic indications in that particular school.

As a usual practice, the supervisor observed at least three classes in the particular subject under investigation, one class each from the primary, intermediate and grammar sections of the school. This gave a good sampling of the school work and provided sufficient data for a clear diagnosis of the character of the work done in that school in that particular subject.

The supervisor took brief notes, as unobtrusively as possible, of the work observed. This was for the purpose of living over later the details of what was observed and for conferring with the teacher.

3. *Talked to the School*—At the close of the supervisor's visit, he usually took about five minutes for talking to the school about the work. He desired to leave the children and the teacher pleased because of

the work that they had done well and unsatisfied, not dissatisfied, with themselves over the work which they had not done so well. The remarks were addressed to the children. What was meant for the teacher was usually implied in what was said to the children. It was constantly the aim of the supervisor to inspire and to guide the schools rather than to criticize them. To leave the school feeling that it had done well in certain particulars and ambitious to do even better the next time in other particulars is, in the writer's opinion, a better means through which to secure improvement than to leave the school conscious of the supervisor's disapproval and crestfallen because of its own failure

4. *Conferred with the Teacher*—The supervisor's conference with the teacher while visiting the school was usually very brief and quite superficial. Only those matters of local and immediate importance were discussed at the classroom conference. The larger matters of professional importance were reserved for the general conference to be held with the entire group of teachers at the close of the week. (The group conference will be discussed later.) The reservation of the larger subjects for the general conference stimulated the attendance of the teacher at the group conferences.

5. *Played with the Children*—It is the belief of the writer that the children in the schools may be used very effectively as one of the agencies of supervision. This may be done by making the children aware of their standings in the various subjects and what their standing is compared with what it should be. When this is done, it serves to fix a goal of attainment for

the children. The children thus develop a different attitude toward the school, the teacher, and the supervisor.

The confidence and the good will of the children must be won and held in order to keep them in this attitude toward the school, its work and its officials. One of the most effective means through which this may be done is play. Believing strongly in play as an agency through which to get the confidence of the children, the writer tried to have at least one game with the children upon each visit to the school. Sometimes it was a game with a pedagogical purpose such as a language game, a folk dance, or a physical drill. Sometimes it was an indoor game whose only purpose was a trick and a laugh. Sometimes it was an outdoor "rough and tumble." Sometimes the children served as the leaders, sometimes the writer led the game.

The play developed a spirit of comradeship which carried over from the play to the work. It eliminated that reserve and self-consciousness on the part of children while in the schoolroom which prevents them from doing themselves credit while in the presence of visitors.

6. *Visited the People*—If the supervisor's visit to the school affects only the school, then, one of the largest agencies of and for rural betterment has been overlooked—the home. It was the writer's hope that his visit to a school community might bear the maximum of good results. It was with this purpose in mind that he advertised the exact date and purpose of his visits to the schools. Every parent of the community knew exactly when and for what purpose the

supervisor's next visit would be. This made it possible for any of them to visit the school at the same time the supervisor did, if they so desired. They were enabled to confer with him upon any matter with which they thought he might give assistance. This information stimulated constant interest on their part in the particular work which was being carried forward at the school. It provided for a constant change in the topics of family and community discussion.

The supervisor met and visited, briefly, many parents while at the school buildings and while traveling along the roads. He visited a far greater number, though, in their own homes. He always had more invitations than he could accept to visit in the homes of the people. It was while on these visits that the close personal friendships were formed, educational possibilities were discussed, and support for progressive school measures was secured.

E. WHAT WAS DONE AT THE GROUP TEACHERS' MEETINGS

The group meetings of the teachers held monthly had a number of purposes. The major purpose, of course, was the professional improvement of the teachers. The meetings were held on Saturdays, with one exception—December. Attendance was entirely voluntary. The meetings began at 10 a. m. and closed at 3 p. m. From 10-to-12 was devoted strictly to the professional part of the program and was attended only by the teachers and such children as were present for demonstration purposes. The afternoon session from 1-to-3 was devoted to work of a less professional nature and had for its purpose the entertainment of

the general audience. The forenoon part of the program usually consisted of (1) a teaching demonstration by the supervisor, (2) a conference based upon his demonstration, (3) a teaching demonstration by two classroom teachers and (4) a conference based upon their demonstrations, (5) a summary discussion of the subject under investigation.

1. *The Supervisor's Demonstration*—The purpose of the supervisor's demonstration was to initiate the next subject to be emphasized by the group. The special problem for the month was set by means of a brief duscussion led by the supervisor. His demonstration, then, was an attempt to suggest a way by which that problem might be solved. The following instance will illustrate this point.

As stated in an earlier section of this chapter, the first part of the first group meeting of the teachers held on October 4th was devoted to the scoring of some of the standard tests in reading given just a few days before in the schools in which the teachers taught. The teachers were not familiar with standard tests. They did not know how fast children could be expected to read silently and how well they could be expected to understand the things they read. By the time the teachers had each scored a few papers and the scores had been aranged into a table of distribution, with the quartiles, medians, and averages located, the whole problem of teaching silent reading began to dawn upon them. They saw that some children were reading four times as rapidly as others in the same grade. They began to see that the rapid readers were usually the ones whose comprehension was highest. The natural

question, then, was "How can the speed and comprehension of silent reading be increased?" To answer this question then became the major aim of the teachers for the next month.

As a further preparation of the teachers for the observation and criticism of a recitation in silent reading the following general suggestions were distributed and discussed briefly before the demonstration was given:

GENERAL SUGGESTIONS ON READING IN THE PUBLIC SCHOOLS

M. S. PITTMAN, Helping-Teacher, Brown County, S. D.

Silent Reading

Authorities declare:

1. That we do much more silent than oral reading.
2. That school practice usually retards rapid, thoughtful silent reading, because:
   (1) The school does not give sufficient emphasis to speed and thought getting in silent reading.
   (2) Schoolroom practice fixes a very slow reading rate.
   (3) It too often fixes the habit of lip reading.
   (4) The limits of the lessons are so fixed that it often deadens interest in reading.
   (5) It destroys the child's initiative.
   (6) It too often fixes the habit of overlooking the thought and centers the attention upon less important details.
3. That silent reading can be MUCH more rapid than oral reading.
4. That rapid readers can reproduce much more of what they read than slow readers can and do it with a higher percentage of accuracy.

If these assertions are true, we should give more thought and time to teaching silent reading and less to teaching the type of lessons of which the critics complain.

In our silent reading we should have two big purposes:

1. To develop speed.
2. To develop power in thought getting.

How to secure these:

1. Use literature that is easy for the reader,

2. Use literature that has a strong appeal for the reader,
3. Have contests for speed and thought getting,
4. Have large lesson or story aims,
5. Have small paragraph or special thought aims.

When the essential phases of the preceding suggestions had been located, the supervisor distributed to the teachers the following brief outline of the lesson which he would teach. The teachers were requested to follow the outline as they observed the recitation.

TO ILLUSTRATE HOW TO SECURE RAPID THOUGHTFUL SILENT READING

Text: *Baldwin & Bender's Fifth Reader,* Pg. 216-221.
Lesson Title: WHO IS THE HAPPIEST MAN?
Words to be presented: Croesus, Solon, Tellus, Cyrus, pyre.
Children's general aim: To find who is the happiest man and why.
Children's specific aim: To find the answers to the following questions in the shortest possible time.

1. To whom is a wealthy man compared?
2. What did King Croesus say of himself?
3. To whom is a wise man compared?
4. What question did Croesus ask Solon as they dined together?
5. Why did Solon think that Tellus was so deserving of happiness?
6. Who did Solon think were the next happiest? Why?
7. How did Solon say we could tell when a man is happy and why?
8. What order did King Cyrus give his soldiers about Croesus?
9. What did the savage soldier say as he ran for a torch?
10. What did Croesus exclaim as he lay on the pyre?
11. How did Cyrus decide to treat Croesus and why?

2. *Conference on Supervisor's Demonstration*—After the lesson was completed, a brief conference was held. The following are some of the questions asked and discussed:

1. I noticed that Clifford was always the first child to find the answer to the question. Would not this

make him vain? Should he be in this class in reading?

2. I noticed that Mary was always the last one to find the answer. Would this not tend to discourage her? Should she be in this class in reading?

3. What should be done to bring the slow pupils up to the speed of the rapid ones?

4. What should be done with the rapid ones while the teacher is working with the slow ones?

Other questions were asked but these are sufficient to show that the group was getting at the heart of the problems which confront the teacher of silent reading.

3. *Suggestions for the Following Month*—This meeting closed by the supervisor giving to the teachers the following list of suggestions for their guidance during the following month.

BROWN COUNTY HELPING-TEACHER DISTRICT

M. S. PITTMAN, Helping Teacher

Suggestions to Guide the Work in Reading During Month of October 4—November 1

1. Study very carefully the S. D. Course of Study. It is EXCELLENT. We should know ALL that it says on Reading.
2. In addition to the Course of Study, each teacher should study carefully at least one of the books listed below.
3. Become thoroughly conscious that our problem is to teach the child (a) how to get the thought for himself from the printed page and do it easily, rapidly and thoroughly; (b) how to give the thought to others in an effective and pleasing manner.
4. Since SILENT reading is used more in every-day life than ORAL reading, we should cultivate great skill in silent reading. Let's make efficient silent reading our major interest for the next month.
5. Keep constantly in mind your problem, your aim, in the teaching of reading. Vary your devices for accomplishing your aim.
6. Keep notes on each new device you use as to its success or failure. Explain its results to yourself. Writ-

ten notes made at the close of each day on your efforts will help to clarify your thinking and will aid you in setting up new standards.

7. When you find a good device, work it HARD until you become expert in its application. Keep daily notes on your own growth in its use.
8. Jot down daily knotty questions that trouble you and ask the counsel of the helping-teacher when he comes.
9. Put down each day some question that you would like to have answered at the next teachers' meeting.
10. Take note of any new solutions to your problems so that you can give them to the other teachers of the group.
11. Remember if you hope to develop speed in the reading of your children, you must
    (a) Provide material that is easy for them to read,
    (b) Provide material that is very interesting to them,
    (c) Have sufficient periods in which you test their power to get thought speedily.
    (d) Your personal experimentation in this work will aid you in teaching.

What is your own rate of silent reading? Are YOU up to standard?

SUGGESTED READING FOR THE MONTH:

1. *Teaching Children to Read*—Klapper.
2. *Special Methods for Reading for the Grades*—McMurry
3. *Reading—How to Teach It*—Arnold.
4. *Reading in Public Schools*—Briggs and Coffman.
4. *Primary Reading—Methods of Teaching in Ten Cities*—Educational Pub. Co.
6. *Five Messages to Teachers of Primary Reading*—Sawyer.
7. *The Story in Primary Reading*—Van Ambaugh.
8. *The Dramatic Method of Teaching*—Finlay-Johnson.
9. *How to Teach Reading*—Hall.
10. *How to Teach the Fundamental Subjects*—Kendall and Mirick.
11. *Teaching the Common Branches*—Charters.
12. *The Psychology and Pedagogy of Reading*—Huey.

The plan of procedure above detailed is illustrative of the part which the supervisor performed each month in connection with each new subject taken up for study. Such a detailed statement might be given for all of the seven group conferences but it seems superfluous.

4. *Demonstration Teaching by the Teacher*—After four weeks of experimentation and practice upon the subject demonstrated by the supervisor, two teachers usually would teach a lesson in the same subject for the observation of the group.

On November 1st, four weeks after the supervisor's demonstration discussed above, three of the teachers of the group, Misses Luke, Wineland, and Pabst, taught lessons for the observation of the group illustrating the devices which they had used during the month in order to improve the speed and comprehension of children in the art of silent reading.

Miss Pabst taught a third grade class, Miss Wineland a fifth grade, and Miss Luke an eighth grade.

5. *Summary Discussion of Silent Reading*—The particular demonstrations were not discussed in detail as was the demonstration of the supervisor the previous month, but a general summary discussion of silent reading was had. This discussion was based upon a composite list of questions which had been contributed by the various teachers. The questions were answered in the light of the supervisor's and the teachers' demonstrations, the four weeks of classroom trial, and the reading and thinking that had been done during the month. The following questions constituted the list:

(a) In just what particulars is a recitation which has for its special purpose the development of speed and comprehension superior to the usual "Read next" type of recitation?

(b) If a child, in order to gain in speed, fails to get the thought, what is to be done?

(c) If a child reads very slowly and still fails to get the thought, what is the cause? What is the remedy?

(d) Which is the best method by which to improve the speed and comprehension in silent reading—reading from a regular text in class, reading other material such as newspapers, or reading books at home? What is the service to be rendered by each of these?

(e) Where there is only one child in a class, what can be substituted for the rivalry for developing speed in reading?

(f) What are the principal causes for slow reading? How may the particular causes that affect each child be located? When they have been located, how is the best way to use that knowledge to improve the speed of the child?

F. DISCUSSION OF TEACHER'S CLASSROOM AND DEMONSTRATION TEACHING

In general, critical discussion of lessons observed was undertaken in the group meetings only. The discussions in the individual classrooms were of minor consequence, usually encouraging in tone, and but preliminary to the thorough-going analysis and discussion of the group conference. The writer adopted this procedure for the following reasons:

1. *Limitations of the individual conference*—When the supervisor visited the school, the situation was rarely such as to make an individual conference with the teacher satisfactory or productive of the greatest results, because

(a) The time available was too limited.

(b) The physical situation was not conducive to professional poise. The children were usually present. There were many other matters which the teacher had ir mind—the conduct of the children, the temperature of the schoolroom, etc.

(c) Intellectually, the teacher was probably unprepared for full appreciation of any suggestion which might be given that had any psychological or pedagogical depth.

(d) The mind set of the teacher was not such as to make most profitable an individual conference based upon her own teaching.

2. *Advantages of the group conference*—In view of those limitations, the supervisor endeavored to supply the greater part of the necessary professional guidance through group conferences. The group conference professionalizes the discussion of teaching method in a way that is practically impossible in the individual conference. This is especially true when the individual conference is held at the teacher's own school immediately after the supervisor's observation of her work. The distinct advantages of the group conference were:

(a) There was sufficient time to concentrate upon a professional problem, come to realize its nature, depth, and some of the possible methods of procedure for its solution.

(b) The physical situation was conducive to concentrated and continued thought upon the problem.

(c) The mind set of the teachers and the supervisor was such as to welcome the presentation and discussion of the knotty problems of classroom method.

(d) Freed from the responsibilities of the classroom, equipped with one month of professional reading and classroom practice in connection with the idea under discussion, the teacher was intellectually prepared for an intelligent consideration and discussion of the problem.

(e) Since whatever was done was done explicitly for the entire group, the demonstrations and discussions were freed from the personal elements which might have entered to embarrass the teacher or the supervisor and thereby check the frankest discussion of the problem.

(f) By means of demonstration for the group and discussion by the group, the educational principles were stripped of the personal bias that would enter to limit the discussion in an individual conference.

(g) In the group conference the teachers themselves were the critics instead of the supervisor. This not only relieved the supervisor of the possible odium arising from his criticism but it added power to the teachers.

(h) The group conference developed an *esprit de corps* among the teachers which the exclusive use of the individual conference would not have made possible.

(i) The greatest stimulus to professional reading came through the group conference. When one teacher saw another teacher take a professional book to read during the month, she was disposed to do likewise. When one teacher heard another make an excellent report of some book which she had read, or use to good advantage some point which had been gleaned

from a book recently read, she also was fired to similar purposeful reading.

(j) The group conference generally led to a more satisfactory individual conference, subsequently, than would have been possible otherwise. Afer the teacher had the principle fixed in her mind upon which the group was working, she was then usually anxious to get definite help and suggestion so that she might put into practice what she had come to understand in principle. She had a professional background suitable for making a personal conference not only profitable but thoroughly pleasant both to herself and the supervisor.

(k) Finally, the group conference was a great time saver for both the teachers and the supervisor. Within two hours of demonstration for and discussion by the group, the entire group of fifteen teachers had fixed in mind principles that it would have taken each one, working separately, much longer to grasp.

Chapter V

COMMUNITY ACTIVITIES OF THE SUPERVISOR

In addition to the work which the supervisor did with the teachers and the children, which had for its immediate purpose the improvement of the character of the school work, the sueprvisor participated in other activities, the purpose of which was to stimulate and help the social and economic life of the community. The purpose of such stimulation and help was to increase the service of the school and to win for the school a more intelligent and whole-hearted support. These activities were along six lines:

A. VISITS IN THE HOMES OF THE PEOPLE

The writer believes that the best results can be obtained in the supervision of the schools only when the people understand what is being undertaken. With the purpose of informing the people and with enlisting their interest and co-operation, he decided to visit them in their homes. He announced early in the year that he wanted to visit the patrons. He wanted to take a meal or sleep at the home of every child in the zone. By actual count, he did succeed in doing so in fifty per cent of the homes of the zone.

The visit in the home served as particularly illuminating to the supervisor. He saw what the economic status of the family was. He learned something of the family history. He came to understand its social outlook. He discovered the particular interests of the children in a way that mere schoolroom observations

could never reveal. He entered into friendly relation with all of the members of the family. He was initiated into the home life and after that his interest seemed to become their interest. Their interest became his guide to effective work. The visit was the shuttle which knit their several interests into a consistent educational purpose for the community. What they needed determined his action. What he desired became to them a command for support. This relation could scarcely be developed or maintained without the friendly visit of the supervisor in the homes of the people.

B. THE SCHOOL NEWSPAPER FOR THE ZONE

As one of the means by which the supervisor informed the people of the educational situation, its needs and its achievements, he used a little paper which, for the purpose of appealing to the children, was called "The Joy Maker."

In this little paper he presented, in very simple terms which the smallest child could understand, the aims for the year's work. Here was published the results of the initial survey of the schools with the scores of every child so that he and his family could see how he ranked with every other child of his age and grade in the entire zone. This was explained in terms such that the third grade children could understand them. They understood it so well that any child could tell how he ranked as compared to the median of his grade in all of the thirteen functions in which he was examined. In the paper were published the news items of interest about each school in the zone. The teachers' meetings, the visits of the supervisor to the homes of the people,

the community meetings held at any school building, and all such items were told about in this little paper.

One copy of the paper was sent to every home in the zone where there were children. There were a number of requests for it in homes from which there were no children in the school. The supervisor delivered the papers while on his supervisory visits to the schools.

The school newspaper seems to have been one of the most effective agencies of supervision used by the supervisor. In order to get an estimate of the services which it rendered, the county superintendent sent out a questionnaire to the teachers in which she asked what service it rendered. The following are some of the replies:

"I find that most of the parents themselves read 'The Joymaker,' but as some of them cannot read English very well, I urge the pupils to take turns in reading it to their parents."

"The publication of this little paper, 'The Joy Maker,' helps to keep every one interested in the work. The children are simply delighted to see their names or something about their school in this paper. I find that the parents are just as pleased as the children are."

"I know some people who read more English when they read 'The Joy Maker' than they do during the rest of the month put together."

The supervisor felt that it served to introduce the people and the progress of one school community to all of the other school communities in the zone. He felt that through it the community was prepared for any approaching event that was to occur later. The

entire zone was, as a result of the little paper, not only reviewing the events of the past and understanding the happenings of the present, but it was living, educationally, in the future. If the old statement is true that anticipation is more delightful than realization, the school people have been very remiss in the past in that they have not made large enough factor of anticipation. "The Joy Maker" made anticipation, perhaps, the largest element of the school work. As the writer recalls the year's work, he feels that he heard more expressions of joy arising out of the things which came as a result of the school paper than from any other phase of his work.

The humorous supplement to the paper ("The Smiling Sheet") was another means for educational propaganda. In it were presented little educational sermons in humorous fashion. Each month's issue carried a theme—presented in cartoon form. School buildings were presented one month. At other times school attendance, the shifting of teachers, the hospitality of the people and such ideas were dealth with. The peiple, in general, enjoyed the humorous section of the paper and saw the serious point presented by it.

C. SOCIAL PHASES OF THE TEACHERS' MEETINGS

The teachers' meetings had a purpose beyond the improvement of the technique of teaching. The improvement of technique of teaching was the chief purpose and was the idea around which the program was made, but it was not the sole purpose. Community attitude toward education is as important as the teachers' technique. Each meeting of the teachers, there-

fore, was so arranged that the educational attitude of some community might be influenced.

The place of the meeting was changed each time. There were eight meetings during the year. Seven communities served as the hosts for these meetings. The place was determined by invitation. There were more invitations than there were meetings.

The professional part of the meeting started at 10 a. m. on Saturday morning and continued until noon. At noon the people of the community in which the meeting was being held came and brought dinner for the crowd. The noon hour was always a delightful one, not only because of the bountiful and delightful dinner served, but because of the cordiality of the people.

The afternoon meetings were for the pleasure and inspiration of the people of the community. To this the teachers, children, outside speakers, and the people themselves contributed. Usually some theme of rural interest was discussed as a part of the program. To these meetings came some of the leading educators of the state as speakers. When the meetings first began there was a timidity on the part of the teachers, children, and people, but much of this was overcome before the year ended. Many of them came to have an ease characteristic of people accustomed to participation in public discussion.

D. THE "HEALTH AND HAPPINESS" MEETINGS

In connection with the county health forces the supervisor made a health survey of his district during the month of March, 1920. "The Joy Maker" for the

month of February had prepared the public for this survey. It had presented the need for knowledge of the situation. It had boosted the work that was being done by the Health Crusaders. It had given good health recipes in the form of rhymes. It had presented through the humorous section of the zone paper the difference between the sickly and the healthy child.

Five meetings had been planned for in various parts of the zone, one for each school night of the week. There had been some discussion of the approaching event at the teachers' meeting in February. Language was the school subject which was to be emphasized during the month of March, but health was the subject which motivated practically all of the language work. In a variety and number of ways the subject of health had been presented. The teachers had arranged for the entertainment of the surveying party of five in advance of the visit. The entertainment was so arranged that just as many homes as possible were reached by the members of the party. The object of this was to educate the people by contact with them.

Every child was given a very careful examination and a report was made to his home. In the zone newspaper for the following month a detailed report was also given.

The night meetings at the school buildings were all very successful. An average of seventy-five per cent. of all of the people of each school community attended one of these meetings.

The following subjects were discussed by the following people:

"Animal Health and Its Relation to Man's Health"—County Agent.

"Food and Its Relation to Health"—Home Demonstration Agent.

"Teeth and Their Relation to Health"—A volunteer dentist.

"How to Keep Well"—The County Red Cross Nurse.

"School Buildings and Their Relation to Health"—Supervisor.

E. SPELLING MATCHES

An agency used for excellent socializing purposes during the year was the spelling match. These matches were for three purposes:

1. To create a community consciousness among the people in the experimental supervisory zone.

2. To direct the attention of the children and the adults to certain agricultural terms and ideas through spelling as a means.

3. To provide practice in the spelling of certain words that everyone should be able to spell automatically.

The community in which the experiment was conducted lay near the town of Aberdeen—one of the largest towns in South Dakota. The effect of this nearness to the town was to cause the rural people not to meet together or know their rural neighbors. All of their contacts were with people whom they met in the town. Some of these were rural people but they did not meet in a rural situation. There was little community consciousness or pride. One of the first

aims, therefore, of the supervisor was to get the people to thinking in terms of their own community and come to have a pride in their part of the county.

With this in view the first month that spelling was the subject to be emphasized, agricultural words which were of importance to the county were taken as the basis for study. At the end of the month all of the children and people of the district were brought together at Warner for a spelling match—the adults against the children. People who had lived within ten miles of each other for years but were unacquainted became acquainted on that occasion. The morning was occupied with the spelling match. The afternoon was devoted to addresses by visiting educators.

When spelling was emphasized the second time during the year, it was the last month of the supervisor's work. It was devoted to making automatic the spelling of twelve hundred and fifty-three words which constituted the "Suggested Minimal Spelling List," by Pryor.

On Saturday, April 17th, the final big spelling match and social meeting of the year was held at Mansfield. During the week previous to that event, the supervisor held spelling matches each night at one of the schools which he had visited during the day. To these matches came the children and the adults of the three school districts which had been visited during the day.

The big spelling match held on April 17th at Mansfield was one of the largest meetings ever held in that section of the county. The social attitude manifest at Mansfield on that day was in striking contrast to that

shown at the earlier meetings of the supervisory zone, not in spirit so much as in extent of interest and broadened community outlook.

F. THE CRUSADE AGAINST GOPHERS

The "flicker tail" gopher is one of the agricultural problems of Brown County. The gopher stays in the ground all winter. In the month of April, he comes out and begins to search for food. The gophers are very numerous in parts of the county, so numerous in fact, that they are a real agricultural pest.

The gopher is very easily killed at this season of the year. As succulent food is lacking, they will eat dry oats in most hearty fashion. In the early days of the spring, therefore, is the time to poison them. Practically all of the gophers of a village can be killed in one day at this time if properly poisoned. The supervisor felt that the schools were the proper agency through which to work for the accomplishment of this result because children would look upon the killing of gophers as a sport and would go at the task with zest. Not only this, but the children would be more likely to profit from the teaching than would the adults and they would most likely reap the benefits of their knowledge for a far longer period of time.

With these ideas in mind, the supervisor invited the county agricultural agent to join him on a week of gopher extermination. The week of the series of spelling matches discussed in another section of this chapter was taken as the most opportune time for this work. The people came together for the purpose of engaging in a local spelling match, but they were told

about the gopher poison while there. Discussion and questions were encouraged. The effect was very gratifying.

This was but one of the phases of the supervisor's work which had a direct economic bearing. Not so much was done, though, along economic lines as might have been done and as could easily be done by a supervisor to stimulate the economic life of the community. If the supervisor is alert to his opportunity and to the needs of the territory which he serves, much can be done along economic lines which not only will not interfere with the efficiency of his regular work of classroom supervision but which would actually add to the efficiency of it. Such work would give him greater contact with the business forces of his territory and would develop in them a confidence in him and his work that classroom work alone could never develop.

CHAPTER VI.

THE STATISTICAL DATA OF THE EXPERIMENT

A. THE TESTS

1. *Functions Tested.* In order to have reliable data from which to draw conclusions as to the value of supervision, standardized tests were given in reading, spelling, composition, penmanship, and arithmetic. Thirteen scores were secured for each child with the exception of those in the third and fourth grades for whom the score in fractions was omitted. The children were tested in the following functions:

(a) Speed in reading, number of words per minute
(b) Speed in answering questions on material read
(c) Index of comprehension in reading
(d) Reading, Scale Alpha 2, number of questions answered correctly
(e) Spelling, percentage of words correctly spelled
(f) Written composition
(g) Penmanship, speed, number of letters written per minute
(h) Penmanship, quality
(i) Addition, number right
(j) Subtraction, number right
(k) Multiplication, number right
(l) Division, number right
(m) Fractions, number right

2. *Tests and Scales Used.* The following tests and scales were used in both the initial and final tests:
Reading:

Courtis Standard Research Tests, Silent Reading, No. 2

Thorndike's Scale Alpha 2, Part I and Part II

Spelling:

Ayres' Scale, five words each from columns, L, M, N, O, Q, R, T, U, V. W.

Different words from same columns used for final test.

Composition:

The Nassau County Supplement to the Hillegas Scale.

Penmanship:

The Ayers' Scale.

Arithmetic:

The Cleveland Survey Test.

3. *When Tests were Given.* The initial tests were given between Sept. 28th and Oct. 10th, 1919. They were given to the experimental group during the first three days of the first week. During the remainder of that week and the following week they were given to the control group. There were three school rooms in the experimental group and five school rooms in the control group not tested during the days mentioned above. They were all tested during the week of October 13th-17th.

The final tests were given between May 3rd and May 14th, 1920, and in the same order in which they were given during the initial test.

4. *By Whom Tests were Administered.* The following persons administered all tests, the same person testing the same schools in both the initial and final tests:

Miss Lucile Trott, County Supt. of Brown County.

Miss Ivy Husband, teacher of courses in tests and measurements, Northern Normal and Industrial School.

Mr. J. W. Thomas, Director of Extension, Northern Normal and Industrial School.

Mr. M. S. Pittman, who served as supervisor while conducting the experiment.

The members of the group who administered the tests practiced the giving of the tests so that uniformity of method might be followed.

5. *By Whom Tests were Scored.* All test papers were scored by the members of the classes in tests and measurements of the Northern Normal and Industrial School of Aberdeen, South Dakota, under the direction of Miss Ivy Husband. While a different group of students scored the papers in the final tests from that which scored the initial test, the work was directed by the same person and the same procedure was followed so that the writer feels that the reliability of the results could not be affected therefrom.

B. HOW THE DATA USED WERE SECURED

In the experimental group were 114 children who constituted all of the children in the fifteen schoolrooms supervised who were in grades three to eight inclusive. In the control group were 225 children who constituted all of the children in twenty-five schoolrooms in grades three to eight inclusive.

All of the scores of all of the 114 children in the experimental group were used. The scores of the 114 children in the control group whose initial scores in each subject were most nearly equal to that of the

initial scores of the 114 children in the experimental group, were used. By a comparison of the improvements made by these 114 children in each of these groups, the tables were derived which are presented in this chapter.

C. HOW THE DATA ARE PRESENTED

The data are presented in three different groups of of tables. The first group includes Tables I to VII. These tables show each grade of the experimental group compared with the corresponding grade of the control group in all functions in which the grade was tested. A summary of grade comparisons is given in Table VII. In these tables two results are secured—the average experimental coefficient and the median percentage of progress of the experimental group when measured in terms of progress of control group.

The second group includes Tables VIII to XXI. In these tables comparisons between the experimental and control groups are presented for all functions taken separately. All children in the experimental group are compared to all children in the control group, in the amount of improvement which was made in each function. Table XXI is a summary of these comparisons. In these tables, one result is secured—the equated difference between the groups or the amount of time it will take the control group to attain the same position in amount of improvement now held by the experimental group.

The third group contains only one table, Table XXII. In it is presented a comparison of the percentage of pupils in each grade in each group who improved in each function.

[NOTE: Because of the great number and length of tables from which the data for Tables I to XXII were secured they are not presented here. The original scores from which they were derived and all test papers and original tables from which these data are derived are filed with Teachers' College, Columbia University.]

In offering the tables which follow, the writer proposes to present certain facts. What are the questions to which we expect these tables to supply answers? They are—

1. Out of the total number of tests given, how many results favored the experimental group?

2. Out of the total number of experimental coefficient points, how many favored the experimental group?

3. What was the median progress of the experimental group expressed in terms of progress of the control group?

In interpreting the meaning of each of the figures given in the following tables, the following key will be helpful. The reader should take the first line of Table I and follow it through. This explanation will apply approximately to all other functions.

D. WHAT TABLES I TO VII SHOW*

(1a) shows the average improvement in number of words read per minute by the experimental group.

(1b) shows the degree of unreliability of (1a).

(2a) shows the average improvement in number of words read per minute by the control group.

*All of the tabulated results presupposes scaled data. This is not true of data used in these tables. The exceptions are Alpha 2 Reading results, and all arithmetic results in which the number of questions answered and number of examples solved correctly were taken as the basis instead of the scaled measures generally used for those tests. Since the same principles were applied to the work of both groups, the writer feels that this does not lesson the validity of the measures.

(2b) shows the degree of unreliability of (2a).

(3a) shows the difference in the average improvement of the two groups.

(3b) shows the degree of unreliability of (3a).

(3c) shows the degree of certainty that the true difference, if known, would favor the group which the obtained difference favors. Unity is practical certainty. As the experimental coefficient becomes greater or less than unity, the degree of certainty increases or diminishes accordingly. The experimental coefficient is secured by dividing the difference between the two average improvements by 2.78 times the sigma difference. (For fuller discussion of experimental coefficient, see "How to Measure in Education," by W. A. McCall. The MacMillan Co.)

(4a) shows the average experimental coefficient for all functions in which the grade was tested.

(4b) shows the unreliability of (4a).

(4c) shows the degree of certainty that (4a) favors the experimenal group and is to be interpreted as in (3c).

(5a) shows the progress of the experimental group in each function expressed in percentage of progress of control group.

(5b) shows median of progress expressed in (5a).

NOTE: The explanation given above for reading applies to all other functions listed in the table. Each function has its own unit of measurement. See (A)—Section 1, this chapter.

TABLE I. THIRD GRADE—ALL FUNCTIONS

What Were the Results for the Third Grade

	Functions	Experimental Group (1a) Av. Imp.	Experimental Group (1b) σ Ave.	Control Group (2a) Av. Imp.	Control Group (2b) σ Ave.	(3a) Diff.	(3b) σ Diff.	(3c) Ex. Coef.	Progress of experimental group expressed in percentage of progress of control group. (5a)
1.	Reading Speed	75.23	7.19	40.70	7.63	34.53	10.47	1.18	184.6
2.	Reading Questions	20.09	1.92	9.95	2.32	10.14	10.01	1,21	201.9
3.	Reading Comprehension	—.04	8.80	—1.27	9.36	1.23	12.83	.03	175.0*
4.	Reading Alpha 2	4.00	.57	2.22	.67	1.78	.87	.73	180.1
5.	Spelling	20.36	2.84	5.91	2.32	14.45	3.66	1.42	344.5
6.	Composition	1.21	.25	.70	.25	.51	.34	.54	172.7
7.	Penmanship Speed	22.95	4.56	10.86	2.21	10.09	5.06	.71	193.0
8.	Penmanship Quality	—7.59	1.68	—3.50	2.08	—4.09	2.65	—.61	44.6
9.	Addition	10.59	1.34	6.04	1.50	4.55	2.00	.81	175.3
10.	Subtraction	7.12	1.62	3.03	.83	4.09	1.81	.79	234.9
11.	Multiplication	11.81	1.53	4.18	1.16	7.63	1.91	1.33	282.5
12.	Division	11.27	1.79	5.81	.79	5.46	1.92	1.02	194.0
								(4a)=.81	(5b)=193.5
								(4b)=.154	
								(4c)=1.61	

1. Out of 12 differences shown under (3a), 11 favor the experimental group. (Positive signs favor experimental; negative signs favor control group in all tables.)
2. Out of a total of 10.38 experimental coefficient points shown under (3c), 9.77 favor the experimental group.
3. The median progress of the experimental group was 193.5 per cent. of the progress of the con-

***When the numbers approach zero as in the case of reading comprehension above, the measures become unreliable.**

TABLE II. FOURTH GRADE—ALL FUNCTIONS

What Were the Results for the Fourth Grade?

	Functions	Experimental Group (1a) Av. Imp.	Experimental Group (1b) σ Ave.	Control Group (2a) Av. Imp.	Control Group (2b) σ Ave.	(3a) Diff.	(3b) σ Diff.	(3c) Ex. Coef.	Progress of experimental group expressed in percentage of progress of control group. (5a)
1.	Reading Speed	61.26	8.03	40.06	5.83	20.80	10.00	.74	152.6
2.	Reading Questions...	17.63	2.07	11.53	1.83	6.10	2.57	.85	152.5
3.	Reading Compre.	—6.00	5.38	12.48	6.72	6.48	8.41	.27	208.0
4.	Reading Alpha 2....	5.94	.66	2.84	.84	3.10	1.06	1.05	209.1
5.	Spelling	18.10	3.11	3.68	4.10	14.42	5.14	1.01	491.8
6.	Composition	.76	.20	.86	.28	— .10	.34	— .10	88.3
7.	Penmanship Speed...	10.26	4.33	10.00	3.67	.26	5.67	.01	102.6
8.	Penmanship Quality.	—7.25	1.86	— 8.94	1.56	1.69	7.18	.08	123.3
9.	Addition	11.32	2.70	8.10	1.82	3.42	2.57	.55	134.3
10.	Subtraction	10.84	5.24	1.18	1.04	9.66	2.74	1.30	918.6
11.	Mulitiplication	11.12	1.01	7.37	1.47	3.75	2.70	.50	150.8
12.	Division	10.84	2.03	5.68	1.21	4.16	2.36	.63	190.8

(4a)=.57 (5b)=152.5—
(4b)=.12
(4c)=1.72

1. Out of 12 differences shown under (3a), 11 favor the experimental group.
2. Out of a total of 709 experimental coefficient points, shown under (3c), 6.99 favor the experimental group.
3. The median progress of the experimental group was 152.5 per cent. of the progress of the control group.

TABLE III. FIFTH GRADE—ALL FUNCTIONS

What Were the Results for the Fifth Grade?

Functions	Experimental Group (1a) Av. Imp.	Experimental Group (1b) σ Ave.	Control Group (2a) Av. Imp.	Control Group (2b) σ Ave.	(3a) Diff.	(3b) σ Diff.	(3c) Ex. Coef.	Progress of experimental group expressed in percentage of progress of control group. (5a)
1. Reading Speed.....	48.05	9.71	35.79	12.89	12.26	16.13	.27	134.2
2. Reading Questions...	17.63	1.81	5.11	2.17	12.52	2.82	1.59	345.0
3. Reading Compre. ....—	5.48	3.44	—4.48	3.25	— 1.00	4.47	— .07	81.7
4. Reading Alpha 2.....	6.16	.81	2.23	1.02	3.93	1.06	1.30	276.2
5. Spelling	14.00	1.99	3.53	3.02	10.47	3.61	1.03	396.3
6. Composition	.74	.37	.37	.21	.37	.42	.31	200.0
7. Penmanship Speed ..	28.00	3.22	9.11	.07	18.89	5.14	1.33	307.3
8. Penmanship Quality..—	8.69	1.88	1.00	2.59	— 7.69	3.20	— .86	*
9. Addition	11.32	2.70	8.10	1.91	3.22	3.30	.35	140.0
10. Subtraction	9.22	1.87	6.79	1.40	2.43	2.32	.37	135.7
11. Multiplication	11.90	1.48	8.16	1.40	3.74	2.03	.66	133.5
12. Division	7.46	.97	8.27	.84	— .63	1.28	— .17	92.8
13. Fractions	3.43	.73	1.89	.50	1.54	.87	.63	189.9
							(4a)=.49	(5b)=140
							(4b)=.12	
							(4c)=1.48	

1. Out of 13 differences shown under (3a), 10 favor the experimental group.
2. Out of a total of 8.94 experimental coefficient points shown under (3c), 7.84 favor the experimental group.
3. The median progress of the experimental group was 140 per cent. of the progress of the control group.

*When the signs of the divisor and the dividend are different, it is not clear how the percentage should be expressed.

TABLE IV. SIXTH GRADE—ALL FUNCTIONS

What Were the Results for the Sixth Grade?

	Functions	Experimental Group (1a) Av. Imp.	Experimental Group (1b) σ Ave.	Control Group (2a) Av. Imp.	Control Group (2b) σ Ave.	(3a) Diff.	(3b) σ Diff.	(3c) Ex. Coef.	Progress of experimental group expressed in percentage of progress of control group. (5a)
1.	Reading Speed.....	73.00	11.09	47.85	12.39	25.15	16.59	.54	152.9
2.	Reading Questions..	16.15	1.97	11.60	1.92	4.55	2.35	.69	139.2
3.	Reading Compre. ...	3.85	4.51	2.70	4.25	1.15	6.19	.06	142.6
4.	Reading Alpha 2....	3.40	.79	1.55	.78	1.85	1.08	.61	219.3
5.	Spelling	10.70	2.32	5.10	1.61	5.60	2.82	.71	209.8
6.	Composition	.28	.24	.10	.25	.18	.34	.19	280.0
7.	Penmanship Speed..	16.00	5.45	4.30	2.70	11.70	6.07	.69	372.1
8.	Penmanship Quality	8.85	1.63	— 7.50	2.19	— 1.35	2.44	— .20	84.7
9.	Addition	12.80	1.12	4.70	.93	8.10	1.45	2.01	272.6
10.	Subtraction	10.55	1.35	3.80	1.12	6.75	1.75	1.38	281.8
11.	Multiplication	8.90	.90	4.75	1.25	4.15	1.54	.96	187.3
12.	Division	10.30	1.78	5.20	1.20	5.10	2.14	.85	198.0
13.	Fractions	6.05	1.17	1.15	.70	4.90	1.36	1.28	526.0
								(4a)=.82	(5b)=209.8
								(4b)=.15	
								(4c)=2.00	

1. Out of 13 differences shown under (3a), 12 favor the experimental group.
2. Out of a total of 10.17 experimental coefficient points shown under (3c), 9.97 favor the experimental group.
3. The median progress of the experimental group was 209.8 per cent. of the progress of the control group.

TABLE V. SEVENTH GRADE—ALL FUNCTIONS

What Were the Results for the Seventh Grade?

	Functions	Experimental Group (1a) Av. Imp.	Experimental Group (1b) σ Ave.	Control Group (2a) Av. Imp.	Control Group (2b) σ Ave.	(3a) Diff.	(3b) σ Diff.	(3c) Ex. Coef.	Progress of experimental group expressed in percentage of progress of control group. (5a)
1.	Reading Speed.....	67.68	17.64	35.56	10.12	32.12	20.33	.58	190.3
2.	Reading Questions..	10.88	2.75	14.62	2.57	2.26	3.72	.21	115.3
3.	Reading Compre. ..	1.63	1.50	— 1.00	2.09	2.63	2.58	.36	263.0
4.	Reading Alpha 3....	5.62	.66	2.25	1.71	3.37	1.83	.66	250.0
5.	Spelling	16.00	2.95	4.94	1.22	11.06	3.19	1.24	323.2
6.	Composition	1.20	.36	.27	.25	.93	.43	.78	444.4
7.	Penmanship Speed..	9.00	2.65	7.25	5.00	1.75	5.67	.11	124.1
8.	Penmanship Quality—	6.31	1.93	— 2.68	3.75	— 3.63	4.21	— .31	40.8
9.	Addition	11.38	2.16	7.25	1.43	4.13	2.51	.77	156.9
10.	Subtraction	8.56	.90	3.00	1.84	5.56	2.02	.99	285.3
11.	Multiplication	8.38	1.83	6.42	1.43	1.86	2.25	.29	130.2
12.	Division	10.50	1.14	6.50	1.05	4.00	1.54	.93	161.5
13.	Fractions	4.37	1.71	1.19	.91	3.18	1.96	.58	367.2
								(4a)=.55	(5b)=190.3
								(4b)=.11	
								(4c)=1.83	

1. Out of 13 differences shown under (3a), 12 favor the experimental group.
2. Out of a total of 7.81 experimental coefficient points shown under (3c), 7.50 favor the experimental group.
3. The median progress of the experimental group was 190.3 per cent. of the progress of the control group.

TABLE VI. EIGHTH GRADE—ALL FUNCTIONS

What Were the Results for the Eighth Grade?

Functions	Experimental Group (1a) Av. Imp.	(1b) σ Ave.	Control Group (2a) Av. Imp.	(2b) σ Ave.	(3a) Diff.	(3b) σ Diff.	(3c) Ex. Coef.	Progress of experimental group expressed in percentage of progress of control group. (5a)
1. Reading Speed	85.72	14.37	61.35	9.39	24.37	28.11	.31	139.5
2. Reading Questions..	14.84	2.16	9.56	2.75	5.28	3.49	.54	155.2
3...Reading Compre.....—	1.94	2.19	.88	1.64	— 2.82	2.75	— .37	31.2
4. Reading Alpha 2....	5.44	1.05	1.39	1.09	4.05	1.51	.90	391.3
5. Spelling	9.00	1.29	5.62	2.42	3.38	2.74	.44	259.0
6. Composition	.49	.30	.25	.26	.24	.39	.36	196.0
7. Penmanship Speed ..	4.88	5.75	.22	4.05	4.66	7.16	.23	221.8—
8. Penmanship Quality..—	3.72	4.69	3.05	4.15	— 6.77	6.36	— .36	45.0
9. Addition	11.00	2.24	3.39	1.08	7.61	2.46	1.11	326.0
10. Subtraction	10.39	2.04	4.56	1.95	6.83	2.82	1.00	226.7
11. Multiplication	7.33	1.19	4.11	1.56	3.22	1.93	.61	178.3
12. Division	8.61	2.09	3.72	1.06	4.89	2.34	.75	231.4
13. Fractions	3.34	1.55	2.17	.70	1.17	1.70	.24	154.3
							(4a)=.44	(5b)=196%
							(4b)=.12	
							(4c)=1.33	

1. Out of 13 differences shown under (3a), 11 favor the experimental group.
2. Out of a total of 7.28 experimental coefficient points shown under (3c), 6.55 favor the experimental group.
3. The median progress of the experimental group was 196 per cent. of the progress of the control group.

TABLE VII. SUMMARY FOR ALL GRADES IN ALL FUNCTIONS

What Were the Results for All Grades Taken Together?

	1 Diff. in Av. Imp.		2 Exp. Coef. Pts		3
	Experimental	Control	Experimental	Control	Progress of experimental in terms of control
Third	11	1	9.77	.61	193.5%
Fourth	11	1	6.99	.10	152.5%
Fifth	10	3	7.84	1.10	140. %
Sixth	12	1	9.97	.20	209.8%
Seventh	12	1	7.50	.31	190.3%
Eighth	11	2	6.55	.73	196. %
Total	67	9	44.62	3.05	

1. **Out of a grand total of 76 differences, 67 favor the experimental group.**

2. **Out of a grand total of 51.67 experimental coefficient points, 48.62 favor the experimental group.**

3. **The median progress of the experimental group for all pupils and all subjects was 193.75 per cent. of the progress of the control group.**

The foregoing tables show how the two groups rank when they are compared grade by grade in all functions in which the grades were tested. The sixth grade of the experimental group made the greatest amount of gain (209.8%) and the fifth grade the least amount of gain of all the grades (140%) when compared with corresponding grades of the control group.

E. WHAT TABLES VIII-XXI SHOW

In order to see how the two groups compared in their improvements in the various functions, a series of tables is presented in which all of the children of the experimental group are compared with all of the children of the control group in the degrees to which they have improved in each function. These tables answer two questions:

1. What was the average amount of improvement made by all of the children of the experimental group and by all of the children of the control groups in each function?

2. What is the equated difference between the two groups in each function and which group does the difference favor?

TABLE VIII. SPEED IN READING. (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in the Speed of Reading?

(Unit Used: Number of words per minute)

	Experi. Group		Control Group
Grades	Av. Imp.		Av. Imp.
Third	75.23		40.70
Fourth	61.26		40.06
Fifth	48.05		35.79
Sixth	73.00		47.85
Seventh	67.68		34.56
Eighth	85.72		61.35
Total	410.94		260.31
Av. Total Imp.	68.49		43.38
Diff. of Av. Imp.		25.11	
Equated Difference		.57	

1. The experimental group made an average improvement of 68.49 words per minute as against 43.38 words for the control group. The equated difference is .57.

2. The equated difference means that it would take the control group that fractional part of a year improving at its present rate to gain as great an amount as did the experimental group. It is secured by subtracting the smaller from the larger of the two averages and dividing the remainder by the smaller of the averages, thus:

68.49—43.38=25.11;

25.11 / 43.38=.57, the equated difference

In like manner the equated differences were computed for all other functions: (See "How to Measure in Education"—Wm. A. McCall).

TABLE IX. SPEED IN ANSWERING QUESTIONS IN READING (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in the Speed with Which They Answered Questions Based on the Reading?

(Unit Used: Number of Questions Answered in Five Minutes)

	Experl. Group		Control Group
Grades	Av. Imp.		Av. Imp.
Third	20.09		9.95
Fourth	17.63		11.53
Fifth	17.63		5.11
Sixth	16.15		11.60
Seventh	16.88		14.62
Eighth	14.84		9.56
Total	102.22		62.37
Total Av. Imp.	17.03		10.39
Diff. of Av. Imp.		6.64	
Equated Difference		.63	

1. The experimental group made an average improvement of 17.03 questions as against 10.39 questions for the control group.

2. The equated difference is .63.

TABLE X. INDEX OF COMPREHENSION IN READING. (114 PUPILS IN EACH GROUP.)

What Were the Results for All Grades in Comprehension of Reading?

(Unit Used: Percentage of Answers Correct)

Grades	Experi. Group Av. Imp.	Control Group Av. Imp.
Third	.04	— 1.27
Fourth	—6.00	—12.48
Fifth	—5.48	— 4.48
Sixth	3.85	2.70
Seventh	1.63	— 1.00
Eighth	—1.94	.88
Total	—7.98	—15.65
Total Av. Imp.	—1.33	— 2.61
Diff. of Av. Imp.	+1.28	
Equated Difference	+ .96	

1. The experimental group had an average loss 1.38 as against a loss of 2.61 for the control group.

2. The equated difference is .96 and favors the experimental group.

TABLE XI. NUMBER OF QUESTIONS CORRECTLY ANSWERED ON SCALE ALPHA 2. (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in the Number of Questions Which They Answered Correctly in Scale Alpha 2?

(Unit Used: Number of Questions Correctly Answered in 20 Minutes)

	Experl. Group		Control Group
Grades	Av. Imp.		Av. Imp.
Third	4.00		2.22
Fourth			2.81
Fifth	6.16		2.23
Sixth	3.40		1.55
Seventh	5.62		2.25
Eighth	5.44		1.39
Total	30.56		12.48
Total Av. Imp.	5.09		2.08
Diff. of Av. Imp.		3.01	
Equated Difference		1.44	

1. The experimental group made an average improvement of 5.09 questions as against 2.08 for the control group.

2. The equated difference is 1.44.

TABLE XII. SPELLING (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in Spelling?

(Unit Used: Percentage of Words Correctly Spelled)

	Experi. Group		Control Group
Grades	Av. Imp.		Av. Imp.
Third	20.36		5.91
Fourth	18.10		3.68
Fifth	14.00		3.53
Sixth	10.70		5.10
Seventh	16.00		4.94
Eighth	9.00		5.62
Total	88.16		28.68
Total Av. Imp.	14.69		4.78
Diff. of Av. Imp.		9.91	
Equated Difference		2.07	

1. The experimental group made an average improvement of 14.96 as against 4.78 for the control group.

2. The equated difference is 2.07.

TABLE XIII. COMPOSITION (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in Written Composition?

(Unit Used: Steps on the Nassau Supplement to Hillegas Scale)

Grades	Experi. Group Av. Imp.		Control Group Av. Imp.
Third	1.21		.70
Fourth	.74		.34
Fifth	.76		.86
Sixth	.28		.10
Seventh	1.20		.27
Eighth	.49		.25
Total	4.68		2.55
Av. Total Imp.	.78		.42
Diff. of Av. Imp.		.36	
Equated Difference		.85	

1. The experimental group made an average improvement of .78 as against .42 for the control group.

2. The equated difference is .85.

TABLE XIV. SPEED IN PENMANSHIP (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in Speed in Penmanship?

(Unit Used: Number of Letters Written per Minute)

	Experl. Group		Control Group
Grades	Av. Imp.		Av. Imp.
Third	20.95		10.86
Fourth	10.26		10.00
Fifth	28.00		9.11
Sixth	16.00		4.30
Seventh	9.00		7.25
Eighth	4.88		.22
Total	89.09		41.74
Total Av. Imp.	14.86		6.96
Diff. of Av. Imp.		7.90	
Equated Difference		1.13	

1. The experimental group made an average improvement of 14.86 letters per minute as against 6.96 for the control group.

2. The equated difference is 1.13.

TABLE XV. QUALITY IN PENMANSHIP (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in the Quality of Penmanship?

(Unit Used: Steps on Ayer's Penmanship Scale)

	Experi. Group		Control Group
Grades	Av. Imp.		Av. Imp.
Third	— 7.59		— 3.50
Fourth	— 7.25		— 8.94
Fifth	— 8.65		— 1.00
Sixth	— 8.85		— 7.50
Seventh	— 6.31		— 2.68
Eighth	— 3.72		+ 4.05
Total	—42.37		—20.57
Total Av. Imp.	— 7.06		— 3.43
Diff. of Av. Imp.		—2.63	
Equated Difference		— .76	

1. The experimental group has an average of 7.06 as against a loss of 3.43 for the control group.

2. The equated difference is .76 and favors the control group.

NOTE: What the relative merits of speed and quality are in the complex known as penmanship is not estimated. What would have been the quality of the penmanship of the experimental group if it had written at the rate of the control group is not known The results for each of the functions—speed and quality—are therefore given—and each may be considered for what it is worth.

TABLE XVI. NUMBER RIGHT IN ADDITION (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in Addition?

(Unit Used: Number of Examples Correctly Solved in Fixed Time)

	Experl. Group		Control Group
Grades	Av. Imp.		Av. Imp.
Third	10.59		6.04
Fourth	13.14		10.00
Fifth	11.32		8.10
Sixth	12.80		4.70
Seventh	11.38		7.25
Eighth	11.00		3.39
Total	70.23		39.48
Total Av. Imp.	11.70		6.58
Diff. of Av. Imp.		5.12	
Equated Difference		.77	

1. The experimental group made an average improvement of 11.70 examples solved correctly as against 6.58 for the control group.

2. The equated difference is .77 and favors the experimental group.

TABLE XVII. NUMBER RIGHT IN SUBTRACTION (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in Subtraction?

(Unit Used: Number of Examples Correctly Solved in Fixed Time)

Grades	Experl. Group Av. Imp.		Control Group Av. Imp.
Third	7.12		3.03
Fourth	10.84		1.18
Fifth	9.22		6.79
Sixth	10.55		3.80
Seventh	8.56		3.00
Eighth	10.39		4.56
Total	56.68		22.36
Total Av. Imp.	9.44		3.72
Diff. of Av. Imp.		5.12	
Equated Difference		1.53	

1. The experimental group made an average improvement of 9.44 as against 3.44 for the control group.

2. The equated difference is 1.53 and favors the experimental group.

TABLE XVIII. NUMBER RIGHT IN MULTIPLICATION (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in Multiplication?

(Unit Used: Number of Examples Correctly Solved in Fixed Time)

Grades	Experi. Group Av. Imp.		Control Group Av. Imp.
Third	11.81		4.18
Fourth	11.12		7.37
Fifth	11.90		8.16
Sixth	8.90		4.75
Seventh	8.38		6.42
Eighth	7.33		4.11
Total	59.44		34.99
Total Av. Imp.	9.90		5.83
Diff. of Av. Imp.		4.07	
Equated Difference		.69	

1. The experimental group made an average improvement of 9.90 examples as against 5.83 for the control group.

2. The equated difference is .69 and favors the experimental group.

TABLE XIX. NUMBER RIGHT IN DIVISION (114 PUPILS IN EACH GROUP)

What Were the Results for All Grades in Division?

(Unit Used: Number of Examples Correctly Solved in Fixed Time)

Grades	Experi. Group Av. Imp.		Control Group Av. Imp.
Third	11.27		5.81
Fourth	10.84		5.68
Fifth	7.64		8.27
Sixth	10.30		5.20
Seventh	10.50		6.50
Eighth	8.61		3.72
Total	59.16		35.18
Total Av. Imp.	9.86		5.86
Diff. of Av. Imp.		4.00	
Equated Difference		.69	

1. The experimental group made an average improvement of 9.86 examples as against 5.86 for the control group.

2. The equated difference is .69 and favors the experimental group.

TABLE XX. FRACTIONS (114 PUPILS IN EACH GROUP)

What Were the Results for the Fifth, Sixth, Seventh and Eighth Grades in Fractions?

(Unit Used: Number of Examples Correctly Solved in Fixed Time)

	Experl. Group		Control Group
Grades	Av. Imp.		Av. Imp.
Third	——		——
Fourth	——		——
Fifth	3.43		1.89
Sixth	6.05		1.15
Seventh	4.37		1.15
Eighth	3.34		2.17
Total	17.19		6.4c
Av. Total Imp.	4.29		1.6c
Diff. of Av. Imp.		2.69	
Equated Difference		1.68	

1. The experimental group made an average improvement of 4.29 examples as against 1.60 for the control group.

2. The equated difference is 1.68 and favors the experimental group.

Since the amounts of improvements in the thirteen different functions are not comparable measures, no summary table can be given for them.

The equated differences, though, are approximately comparable and their total results are therefore given in the next table.

TABLE XXI. SUMMARY OF EQUATED DIFFERENCES

The length of time that it would take the slower group to make as much improvement as did the faster group is expressed in the fractional part of a year. The rate of the control group is used as the basis in all cases. The degree of superiority of the fast group over the slow group is expressed as follows for each function:

1.	Rate of silent reading	.57	Years
2.	No. of questions answered	.63	"
3.	Index of comprehension in reading	.96	"
4.	Reading, Scale Alpha 2, questions right	1.44	"
5.	Spelling, percentage correct	2.07	"
6.	Composition, Nassau Supp. Hillegas Scale Units	.85	"
7.	Penmanship, speed	1.13	"
8.	Addition, number right	.77	"
9.	Subtraction, number right	1.53	"
10.	Multiplication, number right	.69	"
11.	Division, number right	.69	"
12.	Fractions, number right	1.68	"
13.	Pennmanship, quality, favoring control group	.76	"
Total No. of points favoring experimental group		13.01	
Total No. of points favoring control group		.76	
Algebraic sum of Equated Difference		12.25	

The average equated difference is ..... .942 years.

From the foregoing, it will be seen that out of the thirteen functions compared, the experimental group was superior to the control group in twelve functions and inferior in only one.

The total equated difference shows that it would still take the control group roughly .942 of a year improving at its own speed to attain the same amount of improvement already attained by the experimental group. Stated in another way, we may say that the experimental group did 194.2% as much in the same length of time as did the control group.

By the other method, summarized in Table VII, the experimental group did 193.75% as much as did the control group in the same length of time. Averaging the two, we can say that by these two measures the experimental group did approximately 194% as much in the same length of time as did the control group.

One other method of comparison of the two groups is given in Table XXII. In this table is presented the actual percentage of children in each grade who made improvements in each function during the year. The table answers three questions:

1. What percentage of pupils of each grade of each group improved in each function? (Read the percentages opposite functions.)

2. What is the average percentage of pupils in each grade of each group who improved in all subjects? (Read averages at bottom of table.)

3. What is the percentage of children in all grades in each group who improved in each function? (Read the averages for each group opposite the functions.)

TABLE XXII. PER CENT. OF PUPILS IMPROVING IN ALL FUNCTIONS AND ALL GRADES (114 PUPILS IN EACH GROUP

What Were the Results for All Grades in Each Function and for Each Grade in All Functions?

	Experimental Group Grades							Control Group Grades						
	3rd	4th	5th	6th	7th	8th	Aver	3rd	4th	5th	6th	7th	8th	Aver
Reading Speed	100	100	90	100	88	100	96	81	95	85	80	81	90	85
Reading Questions	95	95	100	100	94	100	97	91	100	75	90	88	80	87
Reading Comprehension	50	25	35	50	50	60	45	40	40	35	45	50	50	43
Reading Alpha 2	95	95	95	80	100	90	92.5	80	80	55	60	56	70	67
Spelling	100	90	95	85	94	95	93	75	70	80	75	75	85	78
Composition	90	70	60	50	69	45	64	80	65	50	30	38	45	51
Penmanship Speed	85	65	100	85	81	70	81	85	75	60	75	69	55	70
Penmanship Quality	0	15	10	15	19	35	16—	30	0	25	15	31	50	25
Addition	95	95	85	100	94	95	94	90	95	85	90	94	90	90
Subtraction	80	85	85	100	100	95	91	80	60	85	85	56	60	71
Multiplication	95	95	100	100	75	90	91	80	80	95	85	81	75	82
Division	100	100	90	95	94	85	94	100	90	100	85	94	85	92
Fractions			90	95	63	70	79.5			70	50	50	80	62
Average	81	77	78	81	71	79		76	71	70	66	66	70	

1. Table XXII shows that the average number of pupils of each grade of the experimental group, who improved in all functions, is higher in every instance than the average for the corresponding grade in the control group. (Read averages at bottom of table.)

2. It shows, also, that the average for all grades of the experimental group is higher for twelve out of the thirteen functions than are the corresponding averages for the control group. (Read averages at sides of table.)

The only case of superiority out of the nineteen averages secured is that of quality of penmanship in which an average of only 16 per cent. of the experimental group show improvement as against 25 per cent of the control group.

F. SUMMARY OF STATISTICAL RESULTS

By all of the methods of comparison shown in tables I to XXII the results of the year's work by the experimental group are superior to those by the control group. The results summarized are as follows:

1. Out of 76 average improvement scores the experimental group was superior in 67. (Table VII.)

2. Out of a total of 51.67 experimental coefficient points, the total measures showing the degree of reliability that the differences indicated are properly placed, 48.62 points favor the experimental group. (Table VII.)

3. The median progress of the experimental group, when expressed in terms of the progress of the control group was 193.75%. (Table VII.)

4. By the equated difference method it is shown that it would take the control group .942 of a year to

reach the same point of improvement attained by the experimental group. (Table XXI.)

5. The average number of children for each grade who improved in all functions combined was greater for each of the six grades in the experimental group than for the corresponding grade of the control group (Table XXII.)

6. The average number of children of all grades combined who improved in each function was greater for the experimental group than for the control group in 12 out of 13 functions. (Table XXII.)

Chapter VII.

RESULTS OF SUPERVISION NOT SHOWN BY STANDARDIZED TESTS

Not all of the results of supervision can be put down in tables with a coefficient of reliability attached. The results may not be less evident or less in effect but our means of determining and recording them are less well standardized. In this chapter a few of these less well standardized results of supervision are presented.

A. RESULTS INDICATED BY THE CHILDREN

When the initial test was given in September, the subject for the composition was "What I would like to do on Saturday." The children, almost unanimously in both groups, said that they would most enjoy going to Aberdeen where they could attend the picture show, get ice cream, and do such other things as country children do when they go to town. The response from both groups of children was the same to this subject.

When the final test was given in May, the subject for the composition was "What I have most enjoyed at school this year." The response to this subject showed that the pleasure content for the two groups of children had been very different during the year.

The six subjects most often mentioned by the 114 children in the experimental group were:

Recess games	11 times
Reading	12 "
The zone newspaper	17 "

Public programs .....18 "
The supervisor's visit.....41 "
Spelling matches .....53 "

The five subjects most often mentioned by the 225 children of the control group were:

Drawing .....19 times
Parties .....20 "
Spelling contests .....31 "
Public programs at Christmas.....42 "
Recess games .....88 "

From the above, it will be seen that the recess of the children occupied the place of lowest importance in the experimental group but they held the highest rank among the pleasures of the children of the control group. This was not due to the fact that recess games had been discouraged in the experimental group, for they had not. On the contrary, the supervisor and the teachers had encouraged them. The reason seems to be simply that the children of the experimental group found the other features more interesting. It is possible that this difference was due to the novelty of the features named by the children of the experimental group. At any rate, it is a fact that the features which the children named most often as those which they had most enjoyed during the year were those features for which supervision was responsible.

B. RESULTS INDICATED BY THE PATRONS

There were many evidences that the patrons were pleased with supervision and that the supervision produced real results in changing their attitude toward the school.

One day while the supervisor was visiting in one of the schools, three parents came in and visited at the same time. When the afternoon session closed the principal of the school said: "I have been the principal of this school for seven years and this afternoon is the first time that I have ever had a parent come and really visit the school."

This visit of these parents was not an unsual instance for the year. The school records show that in years past there had been very little visiting by the patrons of the schools. There was not a school in the experimental group that did not have a number of visitors during the year 1919-20. In some of the districts, every patron was a school visitor at some time during the year. In some of the school districts, visiting the school became one of the adult diversions during the winter months. The parents were not only visitors but were intelligent observers since they knew in advance what the school was trying to accomplish.

The patrons would often ask, when meeting the supervisor, how their school compared with the other schools of the zone in ability to read, do arithmetic, or perform whatever activity the zone was emphasizing. This showed that the patrons were keeping informed as to the activities of the schools and were interested in the progress of the work.

The changing social attitude of the people expressed in the form of private hospitality was one of the most noticeable changes of the year. The writer was told that previously the people had rarely enter-

tained the superintendent of schools or other school officials. This was not due to any lack of appreciation of the importance of the work or to any antipathy to the person of the official, but apparently, the people had not thought of entertaining the school official as a social or educational privilege to be sought. If the official happened around at meal time or at night he was welcomed, but he was not invited in advance to arrange his trip so that he might become their guest. During the year of the experiment the attitude changed very much in this particular. The supervisor did initiate the custom by suggestion but once started, the people kept it going with increasing momentum. Not only was the supervisor the beneficiary of this hospitality, but the teachers also.

From the indications stated above and many others, it is believed that supervision of schools reached the adults of the community and changed their attitudes toward school activities and school officials in a degree proportionally as great as it did the life of the children in the schools.

The writer had no means by which to test the educational and social spirit of the adult part of the community of the control group. Since that group had no supervisor, there was no means by which to check it in the items stated above.

In order to get some evidence of what the people in each group thought of the efficiency of the schools during the year 1919-20, the writer asked the head of the rural department of the Normal School to send

letters to all of the patrons of both groups. The following letter was sent:

My Dear.....

The Northern Normal and Industrial School is anxious to become of more service to the rural schools of Dakota. In order that it may be guided in its work, it needs and seeks the advice and counsel of the rural people of the state. For this reason it is addressing the following letter to you. Will you be good enough to answer the following questions? Please be perfectly frank and answer them just as you feel. Your replies will be held confidential and will be seen only by us and will be used only to guide us in the work that we shall do in working for the schools.

I am,

Yours very truly,
L. B. Sipple,
Head of the Rural Department.

1. Do you think that your community's interest in your school has been greater, the same, or less this year than in former years?
2. Who do you think is responsible for this difference this year?.....
3. What evidence have you of the truth of your statements? .....
   (a) Have there been fewer or more public meetings at the schoolhouse?.....
   (b) Who prompted these meetings?.....
   (c) Have the children, while at home, talked more, the same, or less about their school work than in former years?.....
   (d) Has your teacher been more, the same, or less popular this year than formerly?.....
   (e) Have the children looked forward to school events more or less this year than formerly? .....
   (f) Have the children been more interested in their studies or in the games at school?.....
   (g) In what subjects have they been most interested? .....
   (h) Have the people shown more, the same, or less interest in entertaining in their homes the teacher and the school officials who have visited your school this year?.....
   (i) Are the people of your community more interested in the consolidation of schools than formerly?

If so, what or who has caused this change in school thought?.....

Please write below any thoughts you may have as to how the rural schools can be improved and what we, as a school, can do.

.....
.....
.....
.....
.....
.....
.....
.....
.....

From the letter it can be seen that there was nothing in it to suggest to the reader that its purpose was to get a reaction on the subject of supervision. Questions 1 and 2, nevertheless, did have that as their purposes.

There were only twenty replies from the experimental group and fifteen from the control group. Of the twenty replying from the experimental group, all said that the schools had been better than formerly and that the supervisor was chiefly responsible for the difference. Ten replies from the control group said that there had been little perceptible difference. Five instances reported that the schools were better than formerly and said that the teacher in charge was responsible.

The number of replies was not sufficient to justify the most reliable conclusions but it may be said that the replies from both groups were from the most intelligent people of the communities from which they came. In so far as the replies represent all of the people, therefore, it may be said that those who had had supervision during the year had appreciated its value.

C. RESULTS INDICATED BY THE TEACHERS

At the beginning of the year the teachers of both groups filled out a questionnaire in which the amount of reading done during the previous year was asked for. It was found that but little reading had been done beyond that required by law as a part of the Reading Circle work. This was true of the teachers of both groups alike. Even that which had been done, the evidence indicated had been done quite superficially. At the end of the school year 1919-20, the teachers of both groups were again asked to state the amount of reading done during the year just closing. The replies showed that the teachers in the experimental group had each read an average of 8.6 books during the session, while the teachers in the control group had read an average of 2.6 books. It further showed that the teachers of the former group had attended an average of 6.1 teachers' meetings, while the teachers in the latter group had attended an average of 2 meetings, both of which had been required by law. It further showed that three of the teachers of the 15 in the experimental group were taking extension courses with the Normal School, while none of the 25 of the control group were doing so.

These facts would indicate that the teachers under supervision were really growing professionally. This means even more when it is remembered that the teachers in the experimental group were personally participating in the teachers' meetings which they attended, practically all of them at some time teaching lessons for the observation of the other teachers. The reading which the teachers in this group did was also

probably of a much more thorough type since there was an immediate purpose for what they read. It had a place in the scheme which they were following. Some quotations taken from letters in reply to a questionnaire sent out by the county superintendent will make this point more clear.

One teacher said: "Previously, I seldom read more professional books than was required for the Reading Circle work, as we were never urged to read more."

Another teacher said: "Previously the superintendent's frequent and emphatic 'Our teachers must be professional' was all that inspired me to do any professional reading and that was only the Reading Circle books and my professional magazines. The present plan has prompted me to more professional reading than I have done before. The reason is that I have found out the real reason for professional reading. The first month the reading was a real trial. I did it though and found it to be beneficial. Our reading has always been assigned, that is, references given. I was surprised to find that I came to desire something to read on our problem. I found recently in my collection of books some that I had once read for Reading Circle work. Upon rereading them, I found that I had only skimmed them before. I can account for this only in this way: I had a chance to specifically apply what I read. My educational magazines have been of greater use to me, also, I think for this reason."

Another teacher said: "Previously I have read only what was required for the Reading Circle work. The plan this year has prompted me to do more than ever

before, because as each month approaches I know what subject I shall work upon, while before I simply took a book and read it through chapter after chapter without stopping to apply it. I was reading for the sake of reading the book, not for the purpose of improving my work the next day as I do now."

That the teachers themselves appreciated supervision was evidenced not only by their uniform co-operation and professional spirit but also by their personal attitude toward the supervisor.

D. RESULTS OF SPECIAL CAMPAIGNS

1. *The Health Campaign.* It was not possible to appraise the results of the campaign for better health before the school year closed. Many children did have teeth cleaned and cavaties filled. A few had glasses fitted. Reports from the zone since the close of the experiment indicate that a few have had more serious corrections made, such as the removal of tonsils and adenoids. To what extent, though, this is true and not also true in the control group the writer had no means of ascertaining. Both districts had the same county nurse and she gave the same attention to both groups. The question is, to what extent did the publicity and combined effort of a number of people working together in the experimental group produce greater effect than when the nurse worked alone in the control group?

The writer feels that perhaps the greater results of the campaign would be recorded in the changed outlook and general conduct of the people rather than in the number of children who had special work done on teeth, eyes and throat.

2. *The Campaign Against Gophers.* The opportunity for checking the effect of the gopher campaign was even less than was that of the health campaign. This was true for the following reasons:

(a) If the poisoning method succeeded, very few of the gophers would ever be found, since the method used so operates that the gophers go to their holes before dying.

(b) The number of gophers in the experimental territory and in the control territory would have had to be known before and after the campaign. This was impossible.

(c) The value of the amount of destruction which one gopher would render in one year and amount of his progeny in succeeding years would need to be known. This has been estimated but is not known.

(d) The educational benefit derived by the people —children and adults—as a result of the campaign against the gophers is not known.

While none of these necessary facts are known, the writer feels safe in the assumption that there were positive results in all of these particulars to such a degree as to make the campaign justifiable as an allied project to the school work.

Summarizing the effects of supervision which are not measurable by standardized tests, we may say that the phases are numerous and important, but that the evidence is somewhat nebulous. In the foregoing discussion it has been pointed out that the attitude of the children in both groups in September was the same

toward what constituted a Saturday's pleasure, but in May the attitude of the two groups was very different as to what they had most enjoyed at school during the year. In the experimental group, parents visited the schools during the year as they had not done previously. They entertained the supervisor, they attended more public meetings, they put forth especial effort to render unusual courtesies to the teachers. All of these acts were the result of an attitude which the supervisor had cultivated by providing opportunities for its expression.

Chapter VIII.

RESULTS OF SUPERVISION RESTATED AND DISCUSSED

In evaluating the outcomes of any endeavor in which they are the product of human association, it is likely that the abstract results of the undertaking cannot be dissociated wholly from the personalities of the people engaged. It seems fair to conclude that this principle would apply to the supervision of country schools.

In a questionnaire sent out by the superintendent of Brown County to the teachers in the experimental group, the superintendent asked the teachers: "To what extent do you think the success of supervision in your zone is the result of the particular plan used and to what extent is it the result of the personality of the supervisor?"

In all of the replies the teachers said that the personality of the supervisor was perhaps of the greater importance even though they felt the particular plan used was the best one through which personality might function.

The conclusions which follow must be interpreted, then, in the light of the personality of the supervisor and the teachers engaged. If those personalities had been stronger, probably greater results would have been secured; if they had been weaker, probably less good results would have been achieved.

A. THE RESULTS AND THE MEANS THROUGH WHICH THEY WERE SECURED WERE

1. The children in the supervised schools advanced 194 per cent. as far during seven months in the particu-

lar functions under investigations as did the children with whom they were compared.

The agencies of supervision through which this result was accomplished were:

(a) An initial standardized test in the thirteen functions, the results of which were so published and so applied in the schools that every child could know his own ability in the function and know how he ranked with others in his own school and with all others in his grade throughout the zone.

(b) Seven supervisory tours each of which was devoted to the emphasis of some particular phase of the school work which would improve the children in some of the functions under investigation.

(c) A newspaper for the zone which was used to promote the various phases of work in such a way that the children could understand what was being done and what was the goal sought.

(d) Getting the children to feel that the goal sought was their own goal, not one desired by the teacher particularly.

(e) Group teachers' meetings at which were discussed the principles upon which were based the teaching practice after the practice had been illustrated.

(f) The professional reading of the teachers which was motivated by an immediate need for help in the solution of some definite teaching difficulty.

(g) The circular letters of the supervisor in which the exact time and purpose of the next visit to each school was stated.

(h) Personal conferences with the individual teacher (which came as a result of the teacher's seek-

ing) in which were discussed the problems which she brought to the conference for solution.

(i) Visits in the homes of the people through which personal friendships were formed and educational aims were clarified.

(j) Games with the children through which a spirit of understanding, freedom and frankness in action were developed.

(k) Brief talks to the children while visiting the schools. The talks were never over five minutes in length. The purpose of the talks was to instruct and inspire the children along the particular line of school work which was being studied during that month. The talks were not sermonettes, nor were they jokes, they tried to be business talks to children, so brief and clear that the two or three essential points emphasized could be understood and remembered.

(l) Public meetings with definite purposes. These meetings had four purposes: (1) To interest and inspire the rural people educationally, (2) to provide opportunity for larger and more frequent social contact, (3) to give instruction in matters of health and to strengthen the purpose of the people to put into practice what they already knew, (4) to disseminate knowledge which would lead to economic betterment.

(m) A final standardized test of the schools which test was announced at the time the initial test was given.

That the writer felt each of these agencies important is evidenced by the fact that he made use of them. He does not know which of them was of most value or that all of them were of value. That remains for some

future experiments to determine. It may even be true that some of the agencies used were hurtful in effect. All that we are prepared now to say is that used together the good results were more by 94.1 per cent. than were the evil effects.

Granting this, the writer may be privileged to state what, in his opinion, was of greatest worth.

Contrary to custom, the writer feels that the child is the most important agency through which to improve the schools by supervision. Ultimately, all supervision looks to the improvement of the child. Why not, therefore, attack the problem directly instead of circuitously? If the child can come to feel the problems as his own, he will use the teacher and the parent as his helpers. They cease to be his masters and become his helpers.

Taking this point of view of supervision, therefore, the major interest of the writer throughout the year was to inform the child of his true situation, to get him to set up goals for future attainment for him, and to aid him in attaining those goals. It was with this in view, therefore, that the details of the initial survey were announced, that the approaching final survey was announced at the same time, that the monthly paper was published, that the professional talks were made to the children, that the children were made such an important part of every teachers' meeting, and that such emphasis was placed upon "one thing at a time."

The teacher is the second most important agency through whom the supervisor must work for improving the character of the school work. Nothing can supplant in importance the child's own interest in and

desire for improvement, but second only to that is the teacher's knowledge of how to render him assistance in attaining his ambition. In order that the teacher may do this effectively, she must understand the principles involved. She may get some results by trial and error methods, but the same teacher will get far better results if she clearly sees the problem to be solved and has some clarified theory by which she attacks it.

In order that the teachers might see the problems involved and might develop a clarified theory for attacking them, the particular type of teachers' meetings, which were had during this experiment, was used. It was for this purpose that the supervisor taught demonstration lessons at each meeting as a means of revealing the problems; that one subject was taken for concentrated and concerted study for one month with a second meeting devoted to summarizing the results of the study; that the teachers taught their demonstration lessons at the second meeting and that the professional reading for each month was selected with special reference to the problems involved.

The size of the teachers' meetings was also dictated by this purpose. The writer feels that the large institute which consists of hundreds of teachers is almost a criminal waste of money and opportunity. Beyond the purposes of inspiration and beyond one day in length, they are probably more hurtful than otherwise. To be effective, the writer feels that the group must be small enough for the individual participation of every teacher in every meeting. The group should also be so homogeneous in character and by the nature

of the problems studied that what is of interest to one will be profitable to all.

In order to arrive at a judgment of the most desirable size of the group for the teachers' meetings, the county superintendent, in her questionnaire referred to above, asked "How many teachers should be in a group in order to get the best results from the teachers' meeting?"

The replies indicated that ten should be the minimum and twenty the maximum. There should be just enough to provide for enthusiasm of numbers and yet preserve the freedom which a small group gives.

An intelligent understanding of the problems involved and the methods by which they can best assist in their solution is scarcely less important for the parents than for the teachers of the children. While it should be the ambition of the child which drives him ever forward, it should be the ambition of the parents and teachers to guide him when he is lost and to strengthen him when he is weak. Those children who attend school regularly are the children of parents who have a never-flagging ambition for their children, who watch carefully that their health is preserved and that they have the right sort of a home environment in which to learn and to grow.

The business of supervision, then, in so far as it is related to the home, is to assist every home in becoming such an influence in the life of the children in that home. With this object in mind, the zone newspaper was planned for home consumption as well as for the school. The educational aims and goals for the year were so expressed that every child and every parent could

understand them. Through the child's enthusiasm the parents came to aspire for the same results. The supervisor's visits to the homes and the public meetings which were held all contributed to the same end—developing in the parents a desire to have their children do the best that it was possible for them to do toward the realization of their worthy ambitions in school.

With children, teachers and parents, all conscious of certain worthy aims, aware of certain limiting influences, and convinced of the possibility of certain definite accomplishments through the performance of certain recognized tasks, the work of the supervisor becomes easy, interesting and pleasant.

2. Granting that it would take the children in the control group 94 per cent. of a year longer to do the same amount of work than it did the children in the experimental group, and granting that the results that the schools are working for are results that are socially desirable then, we may conclude that the value of the service of one supervisor who would produce such results in all of the work of the school in forty-five such schoolrooms would be $45,102.15 per year.

This result is secured by multiplying $1066.25, the average expense per annum of the schoolrooms in the experimental group by 94.1% and multiplying the result, $1002.27 by 45, the number of rooms contemplated as the supervisory load. This takes into consideration merely the value of the service to the school itself when measured in terms of pupil progress and entirely ignores any social or economic service which the su-

pervisor may have rendered to the community or the professional service rendered to the teachers.

It is wise and fair to say that the results secured may have been somewhat due to the great possibility for improvement and also to the novelty of the work done. It is not certain that such progress could be shown year after year. The writer believes, however, that such progress could certainly have been shown during the next year. The results of giving standardized tests and the work which followed in the Boston, Mass.,* schools seems to indicate that such a belief on the part of the writer is well founded.

3. The teachers under professional supervision did approximately four times as much professional reading as they themselves had done during the previous year, or as the unsupervised group, with which they were compared, did during the year of the experiment.

This great increase in the amount of professional reading done by the teachers was due to the immediate purposes to be served by the reading, as has already been pointed out. The superiority of this type of reading over the usual Reading Circle work may be more fully appreciated if it is realized that a half dozen or more authorities on the same subject would be studied by different members of the group. This gave an opportunity for comparing the ideas of the several authorities. The discussions were greatly enriched as a result.

4. The average attendance, measured in terms of total enrollment, was 76 per cent. for the year for the

*See Boston School Decument No. 15, 1916, and No. 5. 1918.

supervised schools as against 70.7 per cent. for the unsupervised schools.

This difference is due to two facts, in the writer's opinion. The school enthusiasm was up to a higher standard in the supervised than in the unsupervised schools. This may be illustrated by a incident which occurred in the Rudolf School on Tuesday, April 13th. The supervisor's circular letter had been sent out so that all of the schools knew when he would visit them. When he arrived te Rudolf he found the two children in that school who were in the experiment, Westley Schnorr and Vera Hye, present and ready to show the supervisor what they could do in the subject which was receiving special study for the month. (These were the only children above the second grade in this school.) The teacher was not present and had not been in school during that week. This was typical of the interest of all of the children who were in the experimental group.

The second reason which accounts for the higher percentage of attendance is the fact that a higher percentage of the children enrolled in the seventh and eighth grades continued in school throughout the year.

5. In the schools under supervision, all of the children in the grades from 3 to 8, inclusive, made excellent progress with the greater gains usually in the lower grades. In the group not having supervision, the children in the grades below the seventh did not make the progress which might have been expected if the progress made by the seventh and eighth grades in the same group or with the progress made by the lower

grades of the experimental group were taken as a criterion.

The reason for this is not established. The writer believes that it was due to the fact that in the unsupervised schools the state eighth-grade examination was the largest influence which guided the teaching effort in the schools. The children in those grades, who remained in school throughout the year, were the more intelligent and more ambitious ones. While the pupils of the seventh grade are not urged to take the eighth grade examinations, many of them usually do in such schools. The children in the seventh and eighth grades, therefore, did have a goal for the accomplishments of the year which, as pointed out above, was the largest factor facilitating effective supervision. Not only that, but teachers in one-teacher schools are more often counted successful or unsuccessful by their patrons according to whether or not those children pass who take the State examination. Thus it may be seen that the teachers also had a motive for effective work in the upper grades. Since the work of the lower grades was not so motivated or judged, it may be seen why the children in the lower grades did not make the progress which might have been expected.

6. Supervision served to keep in school children who were in the seventh and eighth grades. Of the children who entered the supervised schools, 92 per cent. continued in school to the end of the year. In the unsupervised schools only 69 per cent. continued in school throughout the year.

This result is due to two things, it seems to the writer.

(a) Supervision served to fix the attention of all of the children upon the desirability of getting an education. Children are easily inspired and they like to do what other children are doing, especially if the other children are praised for their worthy accomplishments. If staying in school becomes one of the items approved by the social group of which the child is a member, he will likely continue in school. Such seems to have been the case in the experimental group.

(b) Through supervision, possibly a higher type of appreciation on the part of the parents had been developed for the education of the children. If any of the children were disposed to quit schools, therefore, the parents gave their opposition to it and their encouragement to finishing the year. How this support of the parents was secured has been discussed already in another section.

7. Supervision promoted the social life of the community. This was done through the various types of meetings discussed in another place.

B. SPECIAL RELATED CONCLUSIONS

In addition to the foregoing results presented and discussed, there are two important related conclusions which should be discussed in this connection.

1. While supervision gave very positive results in the subjects supervised, it did not get those results at the expense of other school subjects, the teaching of which was unsupervised.

This conclusion is justified by the showing made by children in the experimental and control groups who took the State eighth-grade examinations in June, 1920. The children were tested in nine subjects: reading,

writing, spelling, arithmetic, grammar, physiology, history, civics and drawing. The average grade of each group for each subject was as follows:

	Experimental	Control
Reading	76.8	73.
Writing	85.8	81.2
Spelling	90.4	92.7
Arithmetic	70.1	69.4
Grammar	78.1	75.8
Physiology	76.2	70.7
Civics	66.	62.
History	65.2	65.5
Drawing	70.6	73.
General Average	75.6	73.9

From the above comparison it will be seen that of the four subjects which had not been under investigation in the experiment: history, civics, physiology, and drawing,—the experimental group ranks higher in physiology and civics while the control group ranks higher in history and drawing. It should be noted also that the average superiority of the experimental group in the two subjects in which it is superior is slightly more than that of the control group in the subjects in which it is superior. The general average of the experimental group in all nine subjects, when taken together, is also nearly two per cent. higher than the control group average. When it is realized that the point of view and the method of the work of the two groups had been very different throughout the year, these results seem even more convincing. The experimental group had been striving to improve in certain specified functions, the control group had been preparing for the annual eighth grade examinations.

It is probable that the superiority of the experimental group in the subjects of civics and physiology was due to the Health and Happiness Campaign previously discussed.

The one exception to the general tendency of superiority of the experimental group as revealed by the state examinations is that of spelling. This exception may be easily understood when it is recalled (a) that the experimental group held practically all who entered the school in the autumn while the control group lost many. It is reasonable to suppose that it was the less capable of the control group who quit schools and therefore who did not take the state examinations, while in the experimental group the strong and the weak alike were included. (b) The experimental group had devoted two months of the year to work in spelling which had been suggested by the supervisor—the first month the work being of an agricultural nature and the second being devoted to the Pryor Minimal Spelling List. At the same time the seventh and eighth grades of the control group were giving attention to the regular work prescribed for those grades by the State and from which the words for the State examinations were taken.

2. In order to get the best results from supervision, attention must be fixed upon the elements which it is desired to improve.

By reference to Table XV and Table XXII it will be seen that in the quality of penmanship alone did the total average progress of the grades of the control group exceed that of the experimental group. This may be explained by the fact that at no time did the supervisor devote a special tour to the subject of pen-

manship. He did test the children in the subject in the autumn and tell them that they would be tested again in the spring. He published the result of the test and the children saw that result. But this, apparently, was not sufficient to fix their attention upon the elements involved. Speed seems to have been the prepotant element in the final test. The speed increased tremendously while the quality was reduced. This was also true in the case of the control group, but not to such a marked degree.

Penmanship is a subject in which two elements are involved: There is a "maximum mean" for speed and quality. If the speed goes beyond that maximum, quality reduces. Speed is an element of good penmanship, nevertheless. If we were to rate the speed as one and the quality as two, the experimental group would be slightly superior to the control group in the whole complex called penmanship. The point worthy of most consideration in this connection, though, is that we can not expect children to form correct habits of writing simply by calling their attention two or three times during the year to the elements involved. Specific attention to the elements involved with constant practice is necessary.

C. GENERAL CONCLUSION

The foregoing data show that supervision practically doubled the efficiency of the schools for more than half of the school subjects and that in doing so, it did not decrease the efficiency in the other half of the school work. The teachers did approximately four times as much professional reading as they did without

supervision. School attendance was improved and the children of the advanced grades remained in school longer. The character of the work throughout the grades and the social and economic status of the community were improved.

The obligations for the American school system, which these results imply, are clear. For supervisors not to be supplied is unfair to the taxpayers who provide the funds with which schools are maintained. It is a waste of the time and intelligence of the teachers for them not to have the inspiration to professional growth which supervision gives. The greatest of all losses accrues to the children who might be advancing twice as rapidly and possibly with much more joy if the right sort of supervision were provided.

In order that the school system may supply these needs, it must secure supervisors with personality, training and energy. The supervisors must use a plan which will secure the desired results.

CHAPTER IX

A DISCUSSION OF THE PRINCIPLES INVOLVED IN THE APPLICATION OF THE ZONE PLAN

In view of the fact that this experiment required only one week in four of the supervisor's time, it seems advisable to present in this, the concluding chapter, a fuller discussion of principles involved, especially as they apply to a full time supervisor. The subject is discussed under four heads: (A) The sphere of the supervisor, (B) The schedule of the supervisor's work, (C) The supervisor's assistants, (D) The supervisor's use of publicity.

A. THE SPHERE OF THE SUPERVISOR

No one idea in the administration of rural schools needs to be clarified more than that relating to the sphere of the supervisor. A study of the situation as it now exists in America reported to the N. E. A. in 1920 and 1921 by Miss Fannie W. Dunn reveals that there is no definite and common conception in the minds of the county superintendents as to just what the realm of the supervisor is and how it differs from that of the administrator. In many states, the supervisor is merely a deputy superintendent, there being no clear line of demarkation between the two offices.

The zone plan of supervision is based upon the theory that the two offices are distinctly separated. For the zone plan to be effectively applied, the writer feels that both the superintendent and the supervisor should see the distinction, and work according to the distinc-

tion practically all of the time. There may be times when the supervisor would discharge an administrative function and there might be times when the superintendent would perform a supervisory function, but each should be conscious when he is working in the other capacity.

Administration has to do with the invention, organization and repair of educational machinery; supervision concerns itself with the operation of the machine. Administration must assure itself that the machine will work when it is intelligently handled; supervision must guarantee the intelligent handling.

In his capacity of inventor, the superintendent will serve at times for a short space, actually or mentally, in the capacity of every operator in his system. This is necessary that he may recognize the problems and see the needs which demand new inventions.

In his capacity of organizer, he must be the wizard chess player, who, blindfolded and with his back to his rival, can see all of the possible combinations out of which come victory or defeat.

In his capacity as the man of repairs, he must have a sensitive ear, a keen eye, and a deft hand in order to locate quickly and correct easily the mechanical defects without the interruption of the machine.

The supervisor in his capacity of expert operator must so manipulate the machine that it will improve with use. It is his function to adjust the machine, to care for it, to give it a soul. He gives more freedom where it is too tight; he restricts it in those parts where there is too much play; he becomes its master and it does his bidding.

Administration locates the children for whom a school must be supplied, discovers a responsible board of education to stand sponsor for them, secures a teacher to provide the instruction, taxes the property to pay the teacher's salary, requires the children to attend the school. Supervision adjusts the daily schedule, organizes the course of study to fit the local needs, locates the right child in the proper place according to age, intelligence and training. Supervision looks after the child's health, concerns itself with his behavior, and becomes responsible for his progress. Administration requires of the parents support of the school and of the teacher a legal service from 9 a. m. to 4 p. m.; supervision inspires parents to such loyalty to the school that they will never permit the child to be absent or tardy without cause and *inspires the teacher* so that she would be willing to devote herself to the school from 4 *a. m. to* 9 *p. m.,* and Saturday would be thrown in for good measure. Administration concerns itself with rights, duties, requirements; supervision is concerned chiefly with opportunities, privileges, options. Legal statutes usually define the inside limits of administration; common sense and educational theory are almost the only bounds to supervision.

The zone plan of supervision contemplates freedom for the supervisor to devote his entire time to increasing the joy and efficiency of the school work as such. The supervisor is supposed to do only those things which have as their aim this end. Of course, this might be interpreted to include anything which is related to the school, but the writer does not accept

such a liberal and undefined interpretation. He would not include anything which includes administrative difficulties that do not bear directly upon the school activities of teacher and children. Many other things he will do, but always as means to this end, not as ends in themselves.

B. THE SCHEDULE OF THE SUPERVISOR'S WORK

One of the chief weaknesses of the work of the supervisor of rural schools is the absence of a schedule for his work. He too often allows it to be made by time and circumstances. There are three distinct phases of the supervisor's schedule which he should plan for with definiteness: (a) To what interests shall he give his attention, (b) how much time shall he devote to the field work, (c) how much time shall be devoted to study?

(a) *To what interests shall he give his attention?* The interests of the supervisor must be of two sorts: general and special. He must be responsible for the general operation of the school. The daily schedule must be such that proper emphasis will be given to all of the school interests, that each child will have his share of attention and that the school machinery will work with the greatest ease. He must be conscious of the physical situation in the school. Heating, lighting, ventilation, and sanitation must be kept in mind. The general upkeep of school property and the necessary changes to be made in the physical situation are items of his proper interest. The moral atmosphere of the school should be sensed by the supervisor and given the benefit of his inspiration. These and other such

matters are of but general interest to the supervisor. They bear a close relation to the special things for which he is responsible. He can not do the work which he is supposed to do unless they function properly. Some of them he himself must adjust, others he must report to the administrative forces of the school, the superintendent or the school board who will have to make the correction. They are beyond the limit of means and time at the supervisor's disposal.

The special interest of the supervisor is the improvement of certain phases of the school work. Toward these phases the supervisor should take the attitude of a constructive creator rather than that of mere trouble fixer. There may be times and there may be schools in which matters of general interest must become the problems for specific attention. This should be the exception, though. The matters of general interest can usually be controlled through the wise direction of specific interests. What phases of the school work the supervisor shall elect for his special attention must be determined by the special need of his schools. He can possibly with the greatest profit to the schools emphasize about four different school interests or school subjects during each year. (This is a matter which should be experimentally investigated.) If he devoted himself to four special interests last year and if his teaching corps is practically the same this year, he can with profit take up four new interests for this year's work. While the four selected interests will not be the four most needed by every teacher, the general welfare and progress of the schools will probably be more advanced by such a selection and such concentra-

tion than would be the case if the supervisor permitted the special needs of every teacher to determine his schedule rather than the greatest need of the schools as a whole. Special needs of teachers must be given attention but they should be considered as general interests to be attended to in an incidental way rather than special interests to occupy the center of the supervisor's attention.

(b) *How much time shall he devote to the field?* Many supervisors and superintendents devote certain days of each week to the field work and certain days to the office. The writer feels that for the administrator this may be a wise policy but for the superivor it would be a better plan if he devoted certain weeks to the field and certain weeks to the office.

In practically all counties, teachers' meetings must, for various reasons, be held on Saturday. If teachers' meetings are held on that day the supervisor must be present. Each day of the week he should spend visiting the schools. One day out of each week is too limited an amount of time for him to accomplish what he needs to do in the office if the days come disconnectedly. The writer feels, therefore, that the supervisor should divide his time for work into sections—field work and home work. The field work should occupy about three-fourths of his time and the home work one fourth.

As indicated in a previous section, the supervisor should divide his supervisory territory into three zones, one zone for each week of field work out of each month. There should be an average of about fifteen teachers to

each zone. If the supervisor had more than forty-five teachers, more zones would be necessary.

The zones should be organized according to topographical, social and educational conditions. Galpin, in his book, *Rural Life,* defines the community as that measure of territory where people naturally coöperate to a given end. The roads, the social habits of the people and the character of schools in a given territory will determine what shall be the territory included in each zone. Let us suppose that there were four small towns in the limits of the supervisor's territory, each of which had a teacher for each two grades of the elementary school. It would be better to have the teachers of these four schools meet together in one group, and that these four schools should constitute one zone. Homogeniety of interests would indicate such an organization. If there were twenty one-teacher schools within a radius of seven miles of a center to which the people usually came for social, religious and business reasons, such a group of teachers should form the membership of a zone. If another community were so situated that only ten or twelve teachers could conveniently reach a given point with a reasonable amount of effort, the twelve should constitute the membership of another zone. The number of teachers in one group should never be more than twenty nor less than eight for effective work on the part of both the supervisor and for the members of the group. The writer feels that from twelve to sixteen teachers is the ideal working unit for supervisory purposes, and that from thirty to fifty teachers constitute the supervisory load when the work is done by the zone plan.

When the supervisor is planning his schedule of visists he must give very careful attention to the matter of travel. In this day of automobiles and good roads, wonders can sometimes be accomplished in a short time, but the supervisor must not plan upon the ideal situation, but the worst situation that he has to confront. He must know where the mudholes, the gumbo, the sand, and the hills are located. He must take into consideration snow drifts. He must be familiar with freezes and thaws. He must foresee where he will spend the nights. He cannot make a time schedule without knowing all of these conditions and he should not make a time schedule without keeping it.

During the season of good roads and settled weather, he may plan upon returning to his home in the evenings if he uses a car. During the season of unsettled weather and bad roads, he should plan to spend the nights just as near as possible to the school which he will visit first on the next day. The automobile should be abandoned when travel by means of it is rendered uncertain. The supervisor may ride on horseback or walk during this season. He should keep his schedule at all hazards. From Monday morning to Saturday night should be devoted to the interests of the schools of the zone.

In some places the supervisor may find it more convenient and wiser to have a regular place at which he spends the nights while on his trips. It might be more pleasant for him personally to do this, but for the good of the schools the writer questions the wisdom of such a practice. The contact with the people is invaluable

as a means of school betterment. It may sometimes be difficult for the supervisor, but if his constitution will bear it, the effort will be well rewarded.

The supervisor should not plan to visit more than one school on Monday morning. There are nearly always some matters which demand the supervisor's attention on Monday morning before he can get started on his trip. Provision should, therefore, be made in the supervisor's schedule for these unforeseen matters.

The supervisor should so arrange his itinerary that he begins his observations at a point nearest his starting point on Monday morning and ends it on Friday evening at another point near the "home plate." He should not always make his visits in the same order. If they are reversed each second visit, better results will probably be secured.

The teachers' meeting of each zone should come on the Saturday of the week in which the visits of the supervisor are made. The details of his observations are then fresh in his mind and the minds of his teachers. The "irons are hot" and the welding should be done then.

(c) *How much time shall he devote to study?* The field service is but one phase of the supervisor's work. It is profitless unless the supervisor is fully prepared to make it fruitful. This he cannot do without time in which to store up energy—physical and intellectual. He must have time for organizing his own thinking. He must have ideas with which to think. He must know what others have thought upon the problem which he is attacking.

Three weeks filled with observation of classroom work, home visiting, and group teachers' meetings will call for a period of more quiet in which to collect his thoughts, relax his mind and muscles, and get a proper perspective with which to enter upon the work of the next three weeks. One week is little enough time in which to do this.

The one week out of four which the supervisor plans for his own readjustments should not be infringed upon by other distinctly private interests. That week belongs to the schools and he should use it for the good of the schools. This does not mean that he is to be an office assistant for the superintendent at that time. That week of free time should be devoted to reading, organizing his material, editing his district newspaper, checking up the odds and ends of the work of his district. If he would devote four days to the reading phases of his work and two days to the clerical phases, the writer feels that the best results would probably be secured from the week. The reading of one absolutely new book which bears upon the subject in hand is the minimum requirement which the supervisor should set for himself for each month. This should be supplemented by a comparison with the other old books with which he is already familiar. There will be but slight opportunity for reading while the supervisor is on his field trips. If, though, there is some one book which bears very directly upon the subject in mind, the supervisor might take it along with him so that he might refer to it from time to time for verification or disproof of a point. Such reflection upon the work of another would do much to clarify the su-

pervisor's own thinking. Possible and important as this type of reading is, it must be realized that the advance study of the supervisor must be done in the quiet of his own library. Time must be provided for this if the supervisor is to get most joy and profit from his work and if the school system is to reap the greatest returns from the money which it has invested in his salary.

C. THE SUPERVISOR'S ASSISTANTS

One of the first truths which the supervisor should get fixed clearly in his mind is that there are many other people who can do many things better than he can do them. The task to which he should apply himself most faithfully is to locate those people and inspire them to give the schools the benefit of their excellent work. These people who can be of service to the supervisor in his efforts to serve the schools fall into one of three classes: (a) Clerical helpers, (b) School helpers, (c) Allied helpers.

(a) *Clerical helpers.* Clerical service may be had practically anywhere for half what expert supervisory service should cost. It would be a blind business policy of the school system to use two hundred dollar service for one hundred dollar work. The time of the supervisor should not be taken for the actual writing of routine letters and doing the office chores which less skilled labor can do satisfactorily. The supervisor should dictate his circular letters, notices, etc., and they should be written and mailed by the office clerical force. Even when this is done, there will remain much

of a personal nature which has professional bearing which the supervisor himself will have to do.

(b) *School helpers.* The zone plan of supervision lends itself to the capitalization of the talent of the teachers. The groups are small enough to make individual work of the teachers possible. The plan leads to a discovery of the gifts of teachers in the schoolroom and to the development of their powers for public performance. One of the first opportunities for the assistance of the teachers was illustrated in a previous chapter where it was stated that the teachers graded some of the test papers in reading as a means of revealing the problem to be attacked in silent reading. This plan might be applied with great profit by a regular supervisor.

In regular supervision where the information of the teachers and the improvement of the school work are the major purpose and where the reliability of the results are not so very important, the standard tests might be given and the papers scored each time by the teachers of the zone. If the maximum results for the schools were desired, the supervisor might give the test in each subject at the last visit to the school just prior to the time that it would be taken up for study in the zone meeting. He could bring the test papers to the meeting and the first period of the meeting might be devoted to grading the papers. In this way the weaknesses of the schools would be revealed to the teachers. Each teacher could get a definite idea of how the work in her own school ranked when compared to that in other schools. The whole problem of how to correct the revealed weaknesses would then be

an interesting one. What the supervisor had to offer would then fall upon minds prepared for its reception. The supervisor could use the results from the three zones in his district for comparative purposes with great profit to the schools. Scientific methods and knowledge would thus become the common and applied property of every teacher in the group.

Teachers working together in such a group would give to each other much that the supervisor himself would have to give if working under some other scheme of organization. The demonstration teaching of one teacher might serve as the very best agency of supervision that could be used. A discussion of a demonstration might clarify a pedagogical difficulty for a teacher in a way that a personal conference, without an objective illustration of the point under discussion, could never do. The teachers themselves can be the greatest means of improvement to the members of their group if they are wisely led and the contribution which each has to make is presented. It is the function of the supervisor to discover what contributions are most needed by the members of the group, who can best make those contributions, and then get the contributions made in the best possible manner and at the time that they will do most good.

(c) *Allied helpers.* The supervisor of rural schools should realize that the school business is not a narrow business. It properly connects with the rest of the world with a multitude of threads. It is for the supervisor to select the threads which are to be followed and to guide the quest. To this end he should consider everything and everybody as his natural al-

lies in the education of the girls and boys under his tutelage. If he will keep his eyes open and his mind awake he will see many interests to which to introduce his children and will find many people who will be glad to render them service through his suggestion and guidance.

When properly approached, public-spirited citizens may always be relied upon to render service to the rural communities. Almost any minister, doctor, lawyer, banker or county official will be ready to join in a campaign which has for its purpose the public welfare. Prominent women of every community are delighted to answer the call for service. Singers, readers, lecturers on special topics will gladly render free for a rural audience what they would charge liberally for under usual circumstances. The supervisor should make the most of such a spirit of service. He will liberalize the soul of the giver and will liberalize the ideas of those whom he serves by such an act of commandeering. The fact is, human nature enjoys being commandeered. Everyone likes to feel that his particular gifts are absolutely necessary to the cause. The supervisor should be expert in convincing many people of the necessity for them to render their service in the cause which he is serving—better educated country boys and girls.

The people referred to above constitute the talent for special occasions. There will be times when they are necessary. The probability is, though, that there will be a much larger proportion of time when servants of the workaday sort can be used. These everyday servants are those who are regularly employed by the

county to render public service, such as the county agent, the home demonstration agent, the nurse, and other public officials. These officials will usually be glad to avail themselves of the opportunities provided by the supervisor to present to the people the cause which they represent.

The supervisor may also be able to serve his district by securing for special service representatives from the state department of education, the agricultural college, the university, and normal schools.

One fact the supervisor should always keep clearly in mind in connection with the service of all allied helpers is that they have come to help him do the work which he is trying to do and not that he is serving as their assistant to do their work.

D. THE SUPERVISOR'S USE OF PUBLICITY

Publicity is an agency for service very much overlooked and underrated by the schools. Either a false modesty on the part of school people or the lack of the knack of advertising has in the past prevented the school achivements and school needs from reaching the public. The art of publicity is one to which the supervisor should give his earnest attention. He should concern himself not with getting a news story in the metropolitan daily about some strange or spectacular incident in connection with his work or with the marvels which he is performing as a supervisor. Such news items reach an audience with which he has no legitimate concern. The people in whom he is interested are his own people in his own supervisory district. The news which he wants them to receive is

the news about their schools. The news should be presented in a form which they will understand and appreciate. The more personal and intimate it is, the more they will probably profit from it. To this end he should use three agencies: (a) A school paper for the supervisory district, (b) The local weeklies or dailies, (c) Feature stories in agricultural magazines which have a large local circulation.

(a) *A school newspaper for the supervisory district.* By far the most important of all agencies of publicity for the betterment of the rural schools is a little paper which the supervisor himself edits for his own children. This may be a mimeographed leaflet published monthly. It should be brief, terse and interesting to the children. It should discuss what is being done and what is to be done in the schools. It is usually wise to emphasize one cause at a time. The material should be varied from month to month in such a way as to keep the children looking forward with eagerness to the next issue. The interests of parents and teachers should not be entirely overlooked, but the interests of the children should receive major consideration.

If a supervisor has three zones in his district, his paper should be somewhat different for the different zones. There could be one part which might be common to all zones—that which dealt with matters of news of a local nature might be printed in zone supplements for each zone.

The papers should be issued by the county clerical force and sent in packages to the teachers. Enough should be sent to each teacher for one copy to be given to each family represented in the school. Bet-

ter results will probably be derived from the papers if they are distributed in each zone just immediately prior to the visits of the supervisor to that zone.

(b) *The local newspapers.* Practically every family in the rural district which the supervisor serves will be a subscriber to the local paper. If this is not true, the supervisor will be serving public education if he will stimulate all to become subscribers. The rural people and their work do not receive their just share of recognition from the local press in all communities. This is not always the fault of the papers. The press is usually glad to get the news. The supervisor should aid the newspapers in securing reliable and efficient reporters in the various communities who will report the school news. If the supervisor has a "nose for news" he will be able to suggest many items of interest to these local reporters. The people will delight to see the school news from their own community appearing in the papers along with that of other communities of the county.

(c) *Feature stories in agricultural magazines.* All of the people should be subscribers to a good farm paper or magazine. An occasional story in the farm paper telling of the achievements of some particular community will stimulate the people to read the papers more carefully and more generally and will also inspire not only that community to even greater efforts but also others to copy its good works. Such magazines are usually glad to get such articles with illustrations of the work described. Often the papers are willing to send a staff representative to report the story for them. Certainly an alert supervisor should not

overlook this agency for inspiring one of his communities with pride and at the same time inspiring many others to greater endeavor.

CONCLUSIONS

These are but a few of the many possible agencies through which the supervisor of rural schools may serve his people. The writer does not claim that the zone plan is without limitations or that some other plan may not accomplish even as good results if as conscientiously applied. The only claim that he does make is that it has been tried and does produce results that are worthwhile.

BIBILOGRAPHY

No attempt is made to present a complete bibliography of the literature relating to reading, handwriting, spelling, composition and arithmetic. Only those studies which bear direct relation to the particular phases under investigatio nare presented here.

I. TESTING THE VALUE OF SUPERVISION

Courtis, S. A. *Measuring the Effect of Supervision.* Geography and Society, July 19, 1919.

Reichert, C. Lorena. *Supervision of. Reading.* Paper read before Educational Measurement Section, Wisconsin State Teachers' Association, November, 1919.

II. READING

Brooks, Samuel S. *Conditions Revealed by the Use of Standardized Tests in Rural Schools.* Journal of Educational Research, January, 1921.

Gill, Edmund J. *Methods of Teaching Reading.* Journal Experimental Pedagogy, Vol. I., March, 1912.

Gray, C. T. *Types of Reading Ability as Exhibited Through Tests and Laboratory Experiments.* Supplementary Educational Monograph, Vol. I., No. 5, University of Chicago.

Grav. W. S. *The Relation of Silent Reading to Economy in Education.* Sixteenth Year Book. National Society for the Education. Part I.

Studies of Elementary School Reading Through Standardized Tests. Supplementary Educational Monograph, Vol. I., No. 1, Univ. of Chicago.

Principles of Method in Teaching Reading as Derived from Scientific Investigation. Eighteenth Year Book, Part II. National Society for Study of Education.

Hamilton, F. M. *The Perceptual Factors in Reading.* Archives of Psychology, No. 9, 1907.

Kirchner, H. W. *Report of Reading in Dodgville (Wisconsin) Public Schools.* Starch's Educational Psychology.

King, I. *Comparison of Rapid and Slow Readers in Comprehension.* School and Society, 4: 320-324.

Peters, C. C. *Influence of Speed Drills on Silent Reading.* Journal of Educational Psychology, Vol. 8, Page 350-366.

Boston Public Schools—School Document, No. 18, 1916.

National Society for the Study of Education. The Twentieth Year Book, Part II (entire).

Thorndike, E. L. *Reading as Reasoning—A Study of Mistakes in Paragraph Reading.* Journal of Educational Psychology, Vol. 8, June, 1917.

Waldman, Bessie. *Definite Improvement in Reading Ability in a Fourth Grade Class.* Elementary School Journal, December, 1920.

Waldo, K. D. *Tests in Reading in the Sycamore Schools.* Elementary School Journal. Vol. 15, 251-268.

III. LANGUAGE

Charters, W. W. and Miller, Edith. *A Course of Study in Grammar.* Educational Bulletin No. 9, University of Missouri.

Pillers, H. D. *Oral and Written Errors in Grammar.* Educational Review, Vol. 54, 458-470.

Sears, Isabel and Diebel, Amelia. *A Study of Common Mistakes in Pupils' Oral English.* Elementary School Journal, Vol. 17, 44-54.

IV. SPELLING

Fulton, M. J. *An Experiment in Teaching Spelling.* Pedagogical Seminary, Vol. 21, 287-289.

Horn, Ernest. *Principles of Method in Teaching Spelling as Derived from Scientific Investigations.* Eighteenth Year Book, Part II, National Society for Study of Education.

Kirby, J. T. *Practice in the Case of School Children.* Contributions to Education, No. 58, Teachers College.

Pryor, H. C. *Testing the Value of Concentrating the Attention of Children Upon the Order of the Letters in a Word.* A Guide to the Teaching of Spelling, Chap. I. Macmillan Book Co.

Wagner, C. A. *Grouping by Similarity as a Factor in the Reaching of Spelling.* Univ. of Pennsylvania.

Wallin, J. E. W. *Spelling Efficiency in Relation to Age, Grade and Sex, and the Transfer of Training.*

V. PENMANSHIP

Freeman, F. N. *Practical Studies in Handwriting.* Elementary School Teacher, Vol. 14. 167-179.

Principles of Method in Teaching Writing as Derived from Scientific Investigation. Eighteenth Year Book, Part II. National Society for the Study of Education.

Judd, C. H. *Penmanship in the Cleveland Survey.*

Starch, D. *The Measurement of Efficiency in Handwriting.* Journal of Educational Psychology. Vol. 6. 106-114.

VI. ARITHMETIC

Ballou, F. W. *Improving Instruction Through Educational Measurement.* Educational Administration and Supervision, Vol. 2, June, 1916.

Brown, J. C. *An Investigation on the Value of Drill Work in the Fundamental Operations in Arithmetic.* Journal of Educational Psychology, Vol. 2, 81-88. Vol. 3, 561-570.

Bulletin No. 7. School Document No. 3, 1916, Boston Public Schools.

Conrad, H. E. and Arp, G. F. *An Experimental Study in Economic Learning.* Journal of Educational Psychology. Vol. 2, 507-529.

Drusal, J. A. *A Study of the Amount of Arithmetic in the Command of High School Graduates, Who Have Had no Arithmetic in the High School.* Educational School Journal, Vol. 17, 657-661.

Hahn, W. H. and Thorndike, E. L. *Some Results in Addition Under School Conditions.* Journal of Educational Psychology, Vol. 5, 65-84.

Kerr, Mary. *The Effect of Six Weeks of Daily Drill in Addition.* Indiana University Studies.

Kirby, T. J. *The Results of Practice Under School Conditions.* Contributions to Education, No. 58, Teachers' College.

The Results of Three Types of Drill in Arithmetic. Journal of Educational Research, November, 1920.

Kirkpatrick, E. A. *An Experiment in Memorizing vs. Incidental Learning.* Journal of Educational Psychology, Vol. 5, 405-413.

Mead, C. D. *An Experiment in the Fundamentals.* The World Book Co.

Mead, C. D. and Sears, Isabel. *Additive, Subtraction, and Multiplicative Division Tested.* Journal of Educational Psychology, Vol. 7, 261-270.

Phillips, F. M. *Value of Daily Drill in Arithmetic.* Journal of Educational Psychology, Vol. 4, Page 159.

Pyle, W. H. *Economic Learning.* Journal of Educational Psychology, Vol. 4, 148-159.

Thorndike, E. L. *Practice in the Case of Addition.* Journal of Educational Psychology, Vol. 21, 483-486.

Wilbur, Flora. *Experiments with Courtis Practice Pads.* Indiana University Studies.

Wimmer, H. *An Experimental Study of the Effect of Drill in Arithmetic Processes under Varying Conditions.* Indiana University Studies.

379.153 .P689
The value of school supervisio
Stanford University Libraries
3 6105 042 862 040

379.153
P689

379.153 Pittman, M.S. 286339
P689 The value of school supervision.

NAME	DATE	NAME	DATE
J C Almack	Mar 6, 24	Y C Shee	FEB 29 1928
[illegible]	AUG 19 1924	Grace Petty	6 25 [illegible]
[illegible]	SEP 2 1924	Peters S. E.	DEC 21 1928
[illegible]	JUL 21 1925	H M Shallenberg	AUG 16 1930
[illegible]	MAY 9 1926	L. Seymour	JUL 24 1931
[illegible]	MAY 31 26	W. [illegible]	JUL 25 '36
[illegible]	AUG 26 192[illegible]	D. Tolsey	JUL 8 1940
[illegible]	JUL 25 1927	D. Hagemann	JUN 3 1940
	SEP 6 27		

LIBRARY, [illegible] OF EDUCATION
286339

STANFORD UNIVERSITY LIBRARY

To avoid fine, this book should be returned on or before the date last stamped below.

AUG 19 1924
SEP 2 1924
JL 21 1925
MAY 2 1926
MAY 31 26
JL 26 1927
JL 25 1927
SEP 6 27
FEB 29 1928
Summer quar.
1928
Reserved
DEC 21 1928
JUL 24 193
JUL 1940
JUN 3 1946

379.153
P689

379.153 .P689
The value of school supervisio
Stanford University Libraries
3 6105 042 862 040

286339
379.153
P689
Pittman, M.S.
The value of school supervision.
NAME DATE NAME DATE
FEB 29 1928
Y C Chen
Grace Petty
Peters S. E.
DEC 21 1928
AUG 16 1930
JUL 24 1931
JUL 25 1936
JUL 8 1940
JUN 3 1940
AUG 13 1924
SEP 2 1924
JUL 21 1925
MAY 9 1926
MAY 31 1926
JUL 26 1927
JUL 25 1927
SEP 4 1927

286339
SCHOOL OF EDUCATION